COWELL®BMP
임 상 증 례 집

10년의 **성과**, 미래의 **변화**

Cowellmedi
The Pioneers in Dental Implant and E.rhBMP-2

10년의 성과, 미래의 변화

COWELL® BMP
SINCE 2010
COWELLMEDI
Osteoinductive Growth Factor

목차

코웰BMP

골유도성 골이식재
rhBMP-2 + BCP

세계 최초로 개발 된 E.rhBMP-2 (E.Coli derived Recombinant Human Bone Morphogenetic Protein type 2)는 성장인자로써 뼈와 연골 형성을 유도하며, 골아 세포 분화에 중요한 역할을 하는 레티노이드 매개체입니다.

구성

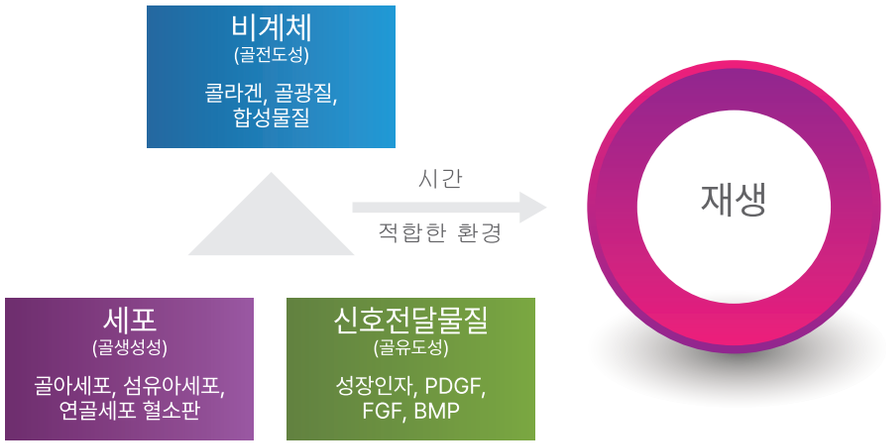
- COWELL® BMP는 세계 최초로 개발 된 E.rhBMP-2 골이식재입니다.
  10년의 기간 동안 다양한 임상례를 기반으로 40개 이상의 연구가 진행 됐습니다.
- BCP는 Carrier로써 공간을 유지관리 합니다.

특징

- 골재생을 위한 연조직의 Primary closure 불필요
- 부착치은 재생
- 어려운 골이식술과 연조직 재생술을 쉽게 시술
- 줄기세포에 직접 작용
- Extraction socket에 감염 없이 골재생 유도
- BMP 1g 당 입자 1mg 포함 (자가골은 1g 당 2ng 포함)

개발 배경

조직재생 3요소



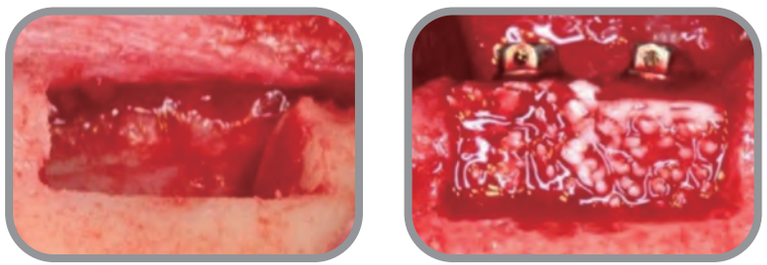
자가줄기세포이식술은

- 조직재생 초기 생착률이 낮아 미세한 효과
- 막대한 세포배양 비용

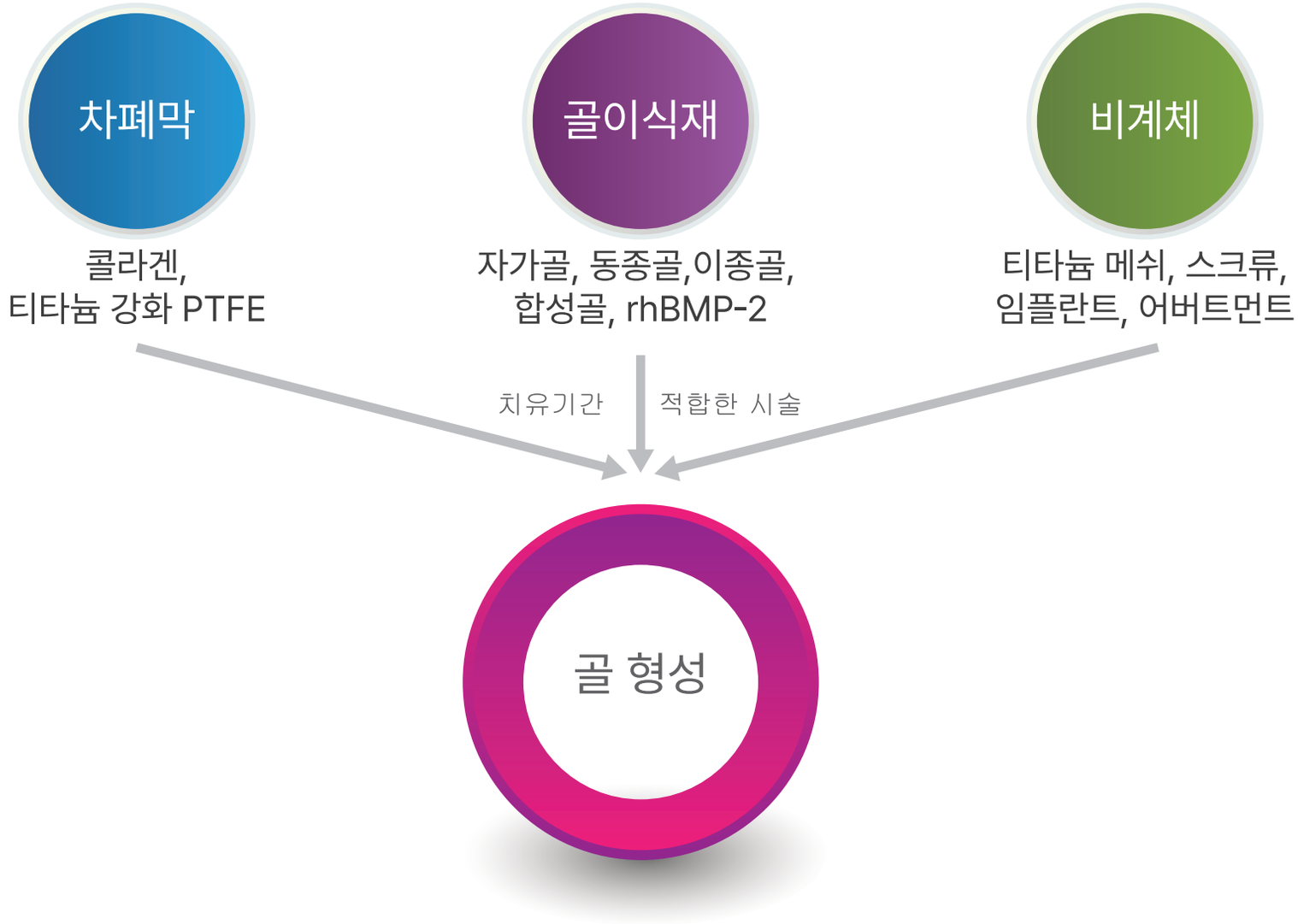
하지만, 줄기세포 성장인자는

- 모든 척추동물 조직재생 효능 보유
- 인간의 성장인자로도 모든 동물과 인간에게 효과적

줄기세포 이식술 VS rhBMP-2

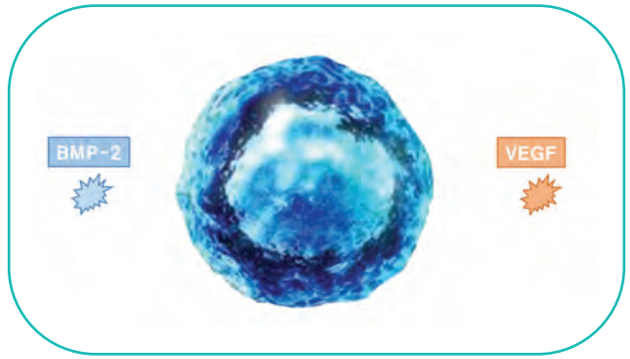


GBR 주요 인자


차폐막
콜라겐,
티타늄 강화 PTFE
골이식재
자가골, 동종골,이종골,
합성골, rhBMP-2
비계체
티타늄 메쉬, 스크류,
임플란트, 어버트먼트
치유기간
적합한 시술
골 형성

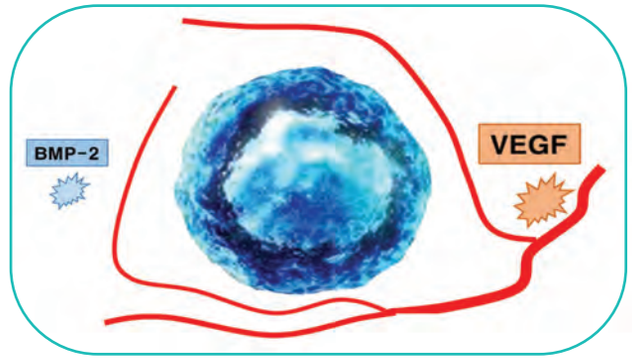
rhBMP-2 줄기세포 작용기전

1. rhbMP-2가 줄기세포의 BMP-2 수용체와 결합하여 핵의 DNA 활동 개시

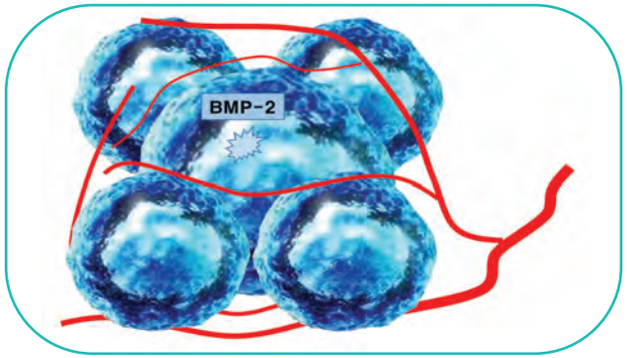


2. 줄기세포의 BMP-2와 VEGF가 작용하여 단백질 합성 및 분비

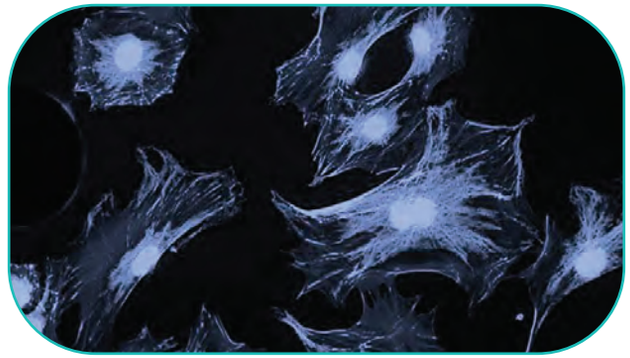
* VEGF : 관내피성장유전자



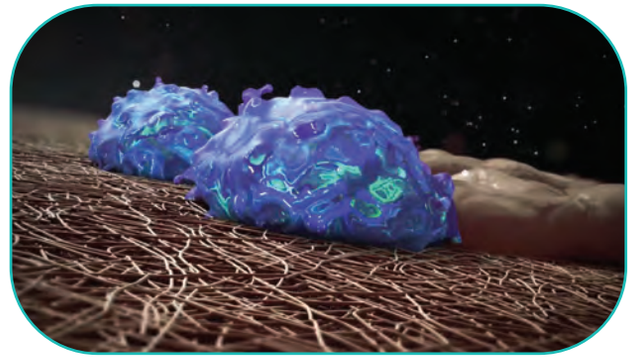
3. VEGF는 줄기세포에 필요한 영양을 공급 할 신생 혈관을 만들어 세포 성장 촉진



4. BMP-2는 주변 줄기세포가 세포 분열하여 빠르게 증식하도록 촉진



5. 증식된 줄기세포는 주변 조직에 맞춰 다양한 세포로 분화



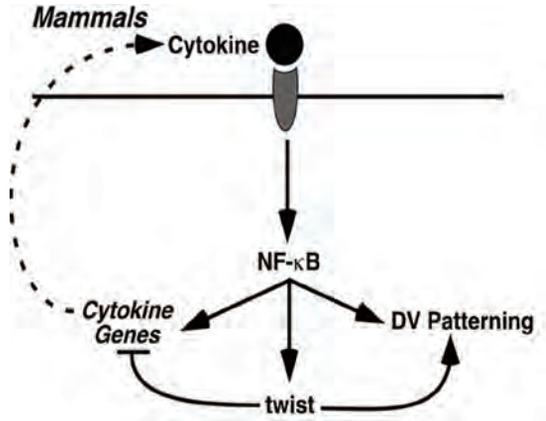
6. 분화 된 세포가 신생 조직을 형성하고 주변 환경에 따라 신생 조직 재형성

일반적인 부작용

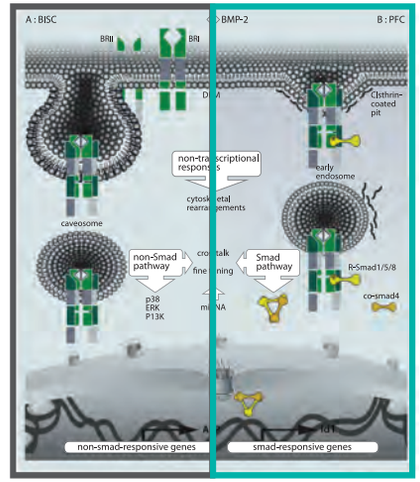
코웰BMP의 안전성

Q : rhBMP-2 사용으로 골 과성장 우려?

A : 골형성 기간이 완료되면 줄기세포에서 Twist-2가 합성되어 세포분화가 정지하도록 하는 기전을 가지기 때문에 **안전합니다.**



Cell, Vol. 112, 169–180, January 24, 2003
European Journal of Endocrinology (2000) 142 9–21

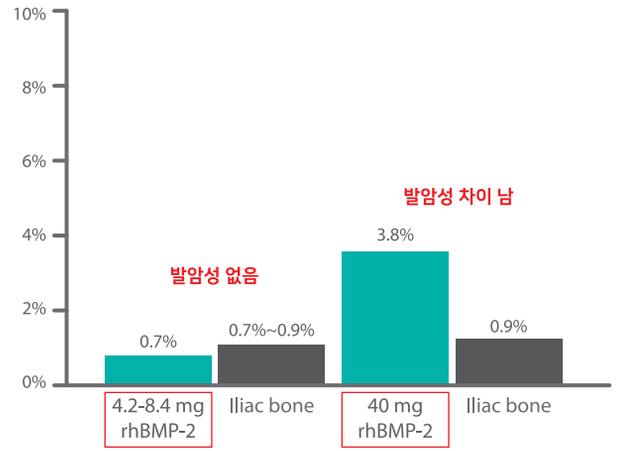


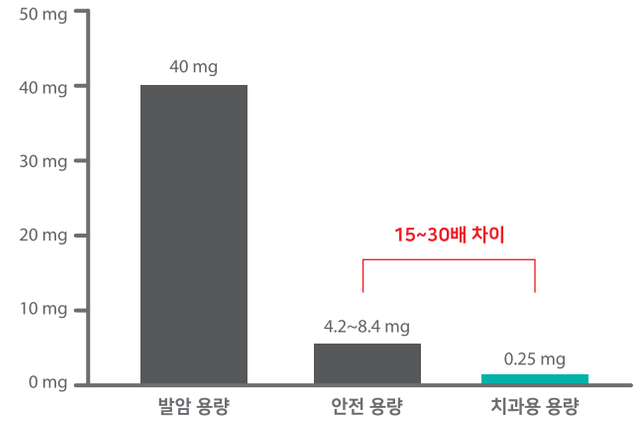
세포증식 **세포분화**

- 수용체에 결합
- 세포내 신호전달 체계
- 세포 핵 이동
- VEGF, BMP 합성 개시

Q : rhBMP-2 사용량과 원발성 발암의 연관성?

A : 일반적으로 rhBMP-2가 발암의 원인이 되는 경우는 40mg 이상 사용 시 입니다. 수 많은 연구를 통해 검증 된 rhBMP-2의 안전한 용량의 기준은 4.2~8.4mg이며, 코웰BMP 0.25g에는 0.25mg의 rhBMP-2가 있어 안전 용량 기준보다 약 15~30배 낮아 **안전합니다.**



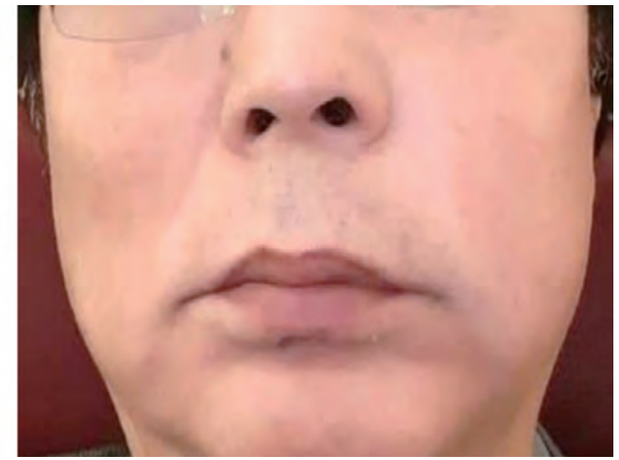


임플란트 부작용

코웰BMP의 안전성

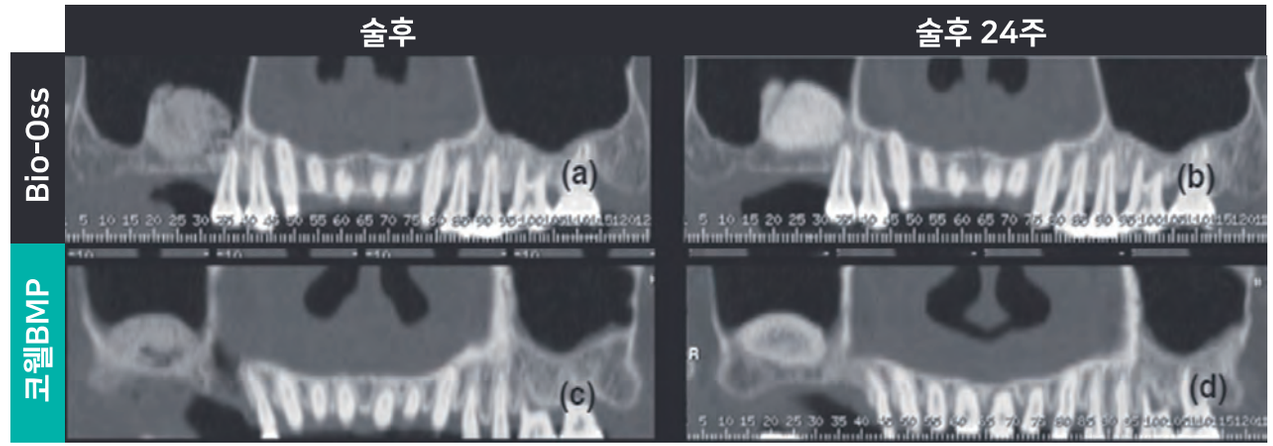
Q : rhBMP-2 사용으로 인한 부종 발생?

A : 이완 절개로 rhBMP-2가 근육 내 신생혈관을 증식시켜
부종이 생기는 경우가 있으나, 통증은 없습니다.
또한, 부종은 일시적으로 나타나는 현상이므로 **안전합니다.**



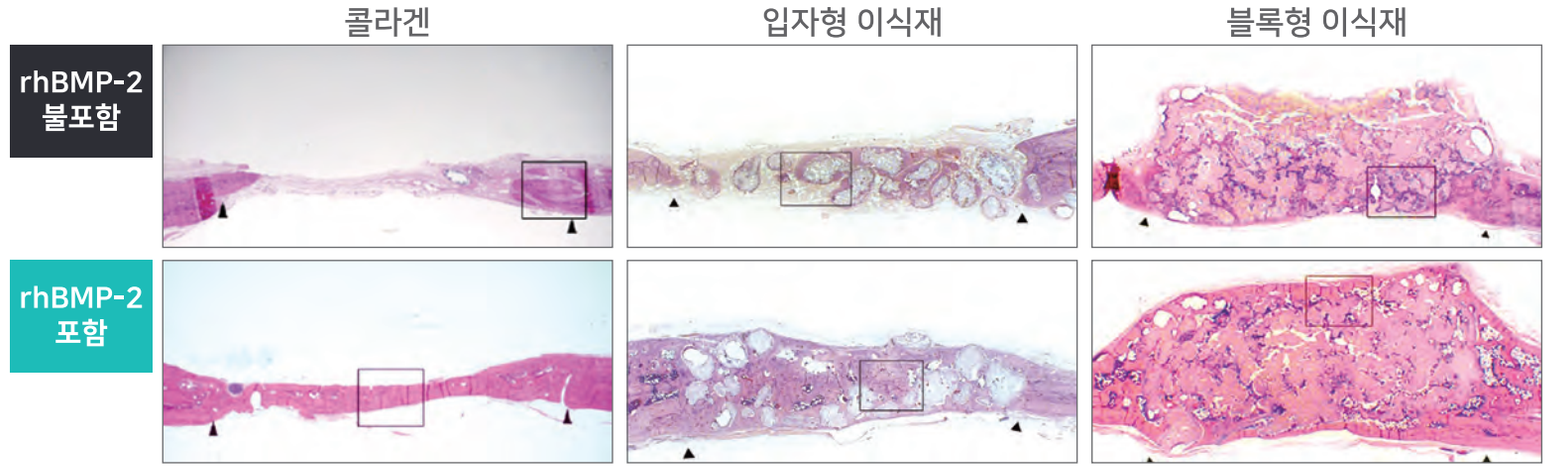
Q : rhBMP-2 사용으로 인한 점액종 발생?

A : 상악동 거상술 후 rhBMP-2에 의한 치유과정에서
과량 분비되는 삼출액은 밀폐된 상악동 골이식부에 저류되어
점액종으로 발전하지만 사라집니다.
다량의 rhBMP-2를 사용하기 보다 최대 0.25mg으로
사용량을 제한한다면 **안전합니다.**

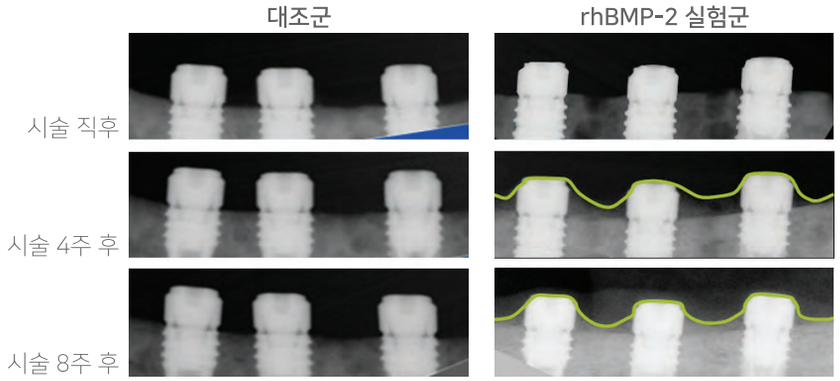


코웰BMP의 유효성

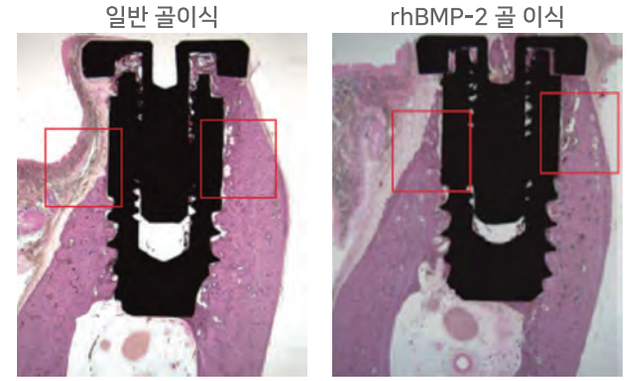
■ 치명 결점 모형
골 이식재 종류



■ rhBMP-2로 코팅한 임플란트
수직 결손



■ rhBMP-2로 코팅한 임플란트
열개 결손

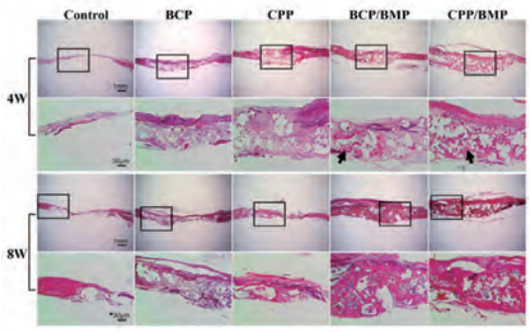


* rhBMP-2 골이식 후 차폐막을 사용하지 않아도 안전한 골재생이 이루어지는 반면, 일반 골이식재 사용 시 차폐막 사용 필수

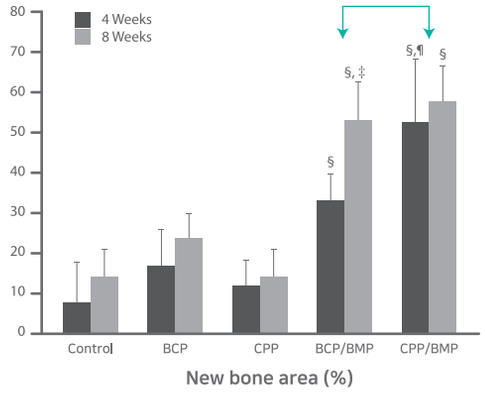
코웰BMP의 유효성

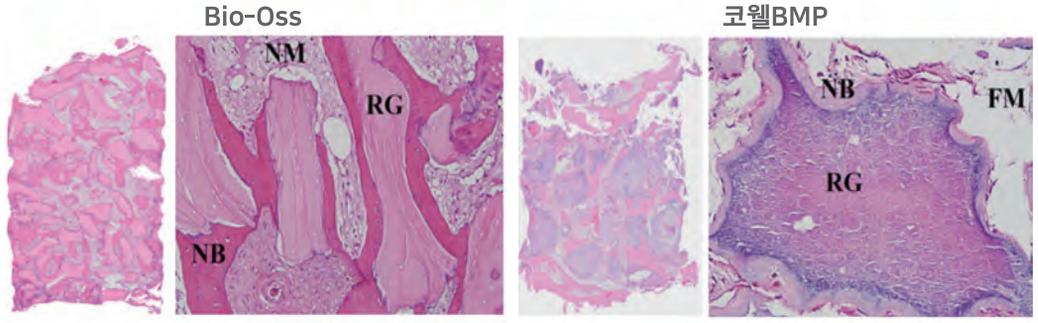
■ 이식재 종류 별 비교

* 피로인산칼슘, CPP(Ca/P=1)가
BCP(Ca/P=1.55)보다 흡수율이 높은 양상



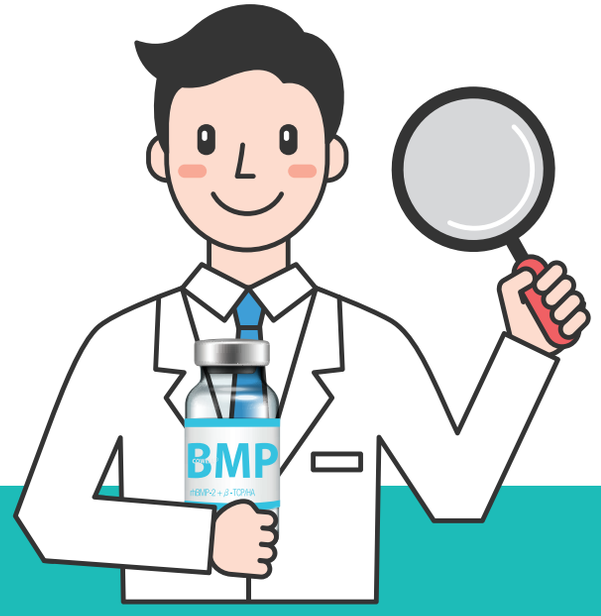
* 피로인산칼슘, CPP(Ca/P=1)가
BCP(Ca/P=1.55)보다 조기에 골 재생되는 효과 확인





신생골 생성비율은 차이가 없고 Bio-Oss에는 입자 사이에 단단한 섬유조직으로 구성되지만 **코웰BMP는 골수 조직이 채워집니다.**
따라서 Bio-Oss는 골이식부에 드릴 중 저항이 높고 **코웰BMP는 골수에 의한 골재형성이 우수합니다.**

BMP, 그 **결과의 차이**는 어떨까요?



BMP, 그 결과의 차이를 경험해보세요!

뼈 이식은 임플란트의 고정력과 수명에 중요한 역할을 합니다.
임플란트 치아 주위를 둘러싼 뼈와 잇몸 재건은 임플란트의 장기적인 수명을 보장하고 심미적인 측면에서도 만족스러운 결과에 기여합니다.

코웰BMP 연구 대학

코웰메디는 과학적이고 임상적으로 입증된 제품들을 제공합니다.

서울대학교 SEOUL NATIONAL UNIVERSITY

연세대학교 YONSEI UNIVERSITY

부산대학교 PUSAN NATIONAL UNIVERSITY

단국대학교 DANKOOK UNIVERSITY

이화여자대학교 EWHA WOMANS UNIVERSITY

고려대학교 KOREA UNIVERSITY

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인하대학교 INHA UNIVERSITY

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한림대학교 HALLYM UNIVERSITY

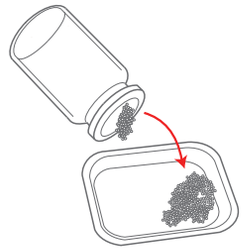
UNIVERSITY OF TORONTO 캐나다

University of Zurich[UZH] 스위스

강릉원주대학교 GANGNEUNG-WONJU NATIONAL UNIVERSITY

제주대학교 JEJU NATIONAL UNIVERSITY

코웰BMP 사용법

① 

코웰BMP 용기 내 골이식재를
본디쉬에 담음

② 

코웰BMP 용기 하단 rhBMP-2
분말에 식염수 주입 *

③ 

rhBMP-2 분말 10초 용해

④ 

주사기로 rhBMP-2 용액 흡입

* 혼합 배율

코웰BMP	식염수
0.1mg	0.1ml
0.25mg	0.2ml
0.5mg	0.4ml

1. 골이식재와 혼합

코웰BMP 양 전체 | 많은 양

골이식 직전 이식재에 적셔서 이식하여 rhBMP-2
단백질이 골이식재 칼슘 성분에 흡착되는 시간을 최소화

입자형 골이식재 

콜라겐 플러그
By. 김태완 과장(분당제생병원) 

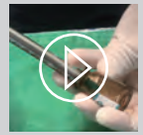
매트릭스 본 

2. 골이식부 주입

코웰BMP 양의 ½ | 중간 양

주입 후 용액이 치은 밖으로 흘러 나오더라도 이식부 줄기세포에는
최소 유효약 효용량에 도달되므로 효과는 동일

일반 시린지 

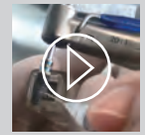
리도카인 시린지
By. 김태완 과장(분당제생병원) 

3. 코웰BMP 코팅 임플란트

코웰BMP 양의 ¼ | 최소 양

임플란트에 용액을 직접 코팅한 후 식립하여
골수의 줄기세포를 직접 활성화 시킴

INNO 임플란트 코팅1 

INNO 임플란트 코팅2 

* 위 QR 코드를 스캔하시면 코웰BMP 사용 영상을 확인하실 수 있습니다.

코웰BMP 임상 논문

1. Analysis of hydrolyzable polyethylene glycol hydrogels and deproteinized bone mineral as delivery systems for glycosylated and non-glycosylated bone morphogenetic protein-2.
   Acta Biomater. 2012 Jan;8(1):116-23.
2. Effects of rhBMP-2 Coating Tricalcium Phosphate on Socket Preservation in Dog Extraction Socket.
   Tissue Engineering and Regenerative Medicine, Vol. 5, No. 4~6, pp 637-642 (2008)
3. Effects of Polycaprolactone-Tricalcium Phosphate, Recombinant Human Bone Morphogenetic Protein-2 and Dog Mesenchymal Stem Cells on Bone Formation: Pilot Study in Dogs.
   Yonsei Med J 50(6): 825-831,(2009)
4. The induction of bone formation in rat calvarial defects and subcutaneous tissues by recombinant human BMP-2, produced in Escherichia coli.
   Biomaterials 31 (2010) 3512–3519
5. Alveolar ridge augmentation using anodized implants coated with Escherichia coli–derived recombinant human bone morphogenetic protein 2.
   Oral Surg Oral Med Oral Pathol Oral Radiol Endod. (2011) Jul;112(1):42-9
6. Bone formation of Escherichia coli expressed rhBMP-2 on absorbable collagen block in rat calvarial defects.
   Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;111:298-305
7. Bone formation of block and particulated biphasic calcium phosphate lyophilized with Escherichia coli–derived recombinant human bone morphogenetic protein 2 in rat calvarial defects.
   Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2011;112:298-306.
8. Induction of bone formation by Escherichia coli- expressed recombinant human bone morphogenetic protein-2 using block-type macroporous biphasic calcium phosphate in orthotopic and ectopic rat models.
   J Periodontal Res. (2011) Dec; 46(6):682-90.
9. Enhanced adipogenic differentiation and reduced collagen synthesis induced by human periodontal ligament stem cells might underlie the negative effect of recombinant human bone morphogenetic protein-2 on periodontal regeneration.
   J Periodontal Res (2011); 46: 193–203
10. The Effects of rhBMP-2 Injection at Distraction Osteogenesis of Rats'Tibia.
    Tissue Engineering and Regenerative Medicine, Vol. 8, No. 2, pp 158-163 (2011).
11. Discontinuous Release of Bone Morphogenetic Protein-2 Loaded Within Interconnected Pores of Honeycomb-Like Polycaprolactone Scaffold Promotes Bone Healing in a Large Bone Defect of Rabbit Ulna.
    Tissue Eng Part A. 2011 Oct;17(19-20):2389-97.v
12. The effect of immobilization of heparin and bone morphogenic protein-2 to bovine bone substitute on osteoblast-like cell's function.
    J Adv Prosthodont 2011; 3:145-51
13. Multicenter, randomized clinical trial on the efficacy and safety of Escherichia coli-derived rhBMP-2 with β-Tricalcium phosphate and hydroxyapatite in human extraction sockets.
    J Adv Prosthodont 2011; 4:178-182
14. Effects of Anodized Implants Coated With Escherichia coli-Derived Recombinant Human Bone Morphogenetic Protein-2 on Osseointegration in Rabbits.
    Tissue Engineering and Regenerative Medicine, Vol. 8, No. 1, pp 62-68 (2011)
15. Novel analysis model for implant osseointegration using ectopic bone formation via the recombinant human bone morphogenetic protein-2/macroporous biphasic calcium phosphate block system in rats: a proof-of concept study.
    J Periodontal Implant Sci 2012; 42:136-143
16. Effects of anodized implants coated with Escherichia coli-derived rhBMP-2 in beagle dogs. Int.
    J. Oral Maxillofac. Surg. 2012; 41: 1577–1584.
17. Bone formation of middle ear cavity using biphasic calcium phosphate lyophilized with Escherichia coli-derived recombinant human bone morphogenetic protein 2 using animal model.
    International Journal of Pediatric Otorhinolaryngology 77 (2013) 1430–1433
18. Bone formation and remodeling of three different dental implant surfaces with Escherichia coli-derived recombinant human bone morphogenetic protein 2 in a rabbit model.
    Int J Oral Maxillofac Implants. 2013; 28(2):424-30
19. Recombinant Human Bone Morphogenetic Protein-2 Stimulates the Osteogenic Potential of the Schneiderian Membrane: A Histometric Analysis in Rabbits.
    Tissue Eng Part A. 2013 Sep;19(17-18):1994-2004
20. The effect of anodized implants coated with combined rhBMP-2 and recombinant human vascular endothelial growth factors on vertical bone regeneration in the marginal portion of the peri-implant.
    Oral Surg Oral Med Oral Pathol Oral Radiol 2013;115:e24-e31.
21. Sinus augmentation using BMP-2 in a bovine hydroxyapatite/collagen carrier in dogs.
    J Clin Periodontol 2014; 41: 86–93.
22. Low-Dose Recombinant Human Bone Morphogenetic Protein-2 to Enhance the Osteogenic Potential of the Schneiderian Membrane in the Early Healing Phase: In Vitro and In Vivo Studies.
    J Oral Maxillofac Surg 72:1480-1494, 2014
23. Prospective randomized, controlled trial of sinus grafting using Escherichiacoli-produced rhBMP-2 with a biphasic calcium phosphate carrier compared to deproteinized bovine bone.
    Clin Oral Implants Res. 2015 Dec;26(12):1361-8.
24. Controlled release of BMP-2 using a heparin-conjugated carrier system reduces in vivo adipose tissue formation.
    J Biomed Mater Res A. 2015 Feb;103(2):545-54.
25. The efficacy of BMP-2 preloaded on bone substitute or hydrogel for bone regeneration at peri-implant defects in dogs.
    Clin Oral Implants Res. 2015 Dec;26(12):1456-65.
26. Effect of rhBMP-2 Immobilized Anorganic Bovine Bone Matrix on Bone Regeneration.
    Int. J. Mol. Sci. 2015, 16, 16034-16052.
27. Effects of rhBMP-2 on Sandblasted and Acid Etched Titanium Implant Surfaces on Bone Regeneration and Osseointegration: Spilt-Mouth Designed Pilot Study.
    Biomed Res Int. 2015; 2015:459393.
28. Comparison of collagen membrane and bone substitute as a carrier for rhBMP-2 in lateral onlay graft.
    Clin Oral Implants Res. 2015;26(1):e13-9.
29. Effects of BMP-2 Delivery in Calcium Phosphate Bone Graft Materials with Different Compositions on Bone Regeneration.
    Materials 2016, 9, 954
30. Source and Carrier Effect on the Bioactivity of BMP Bio-Implants.
    Master of Science 2013. Sylvie Di Lullo 2013, Faculty of Dentistry, University of Toronto
31. Soft and hard tissue changes when socket preservation using rhBMP-2, PRP and Non-Resorbable dPTFE membrane.
    Dental implant Journal: Vol. 3, May, 2014
32. The effect of rhBMP-2 bonegraft on infrabony defects.
    Dental implant Journal: Vol. 3, May, 2014

COWELL® BMP SINCE 2010 COWELLMEDI
Osteoinductive Growth Factor

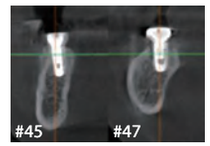
COWELL® BMP CLINICAL CASE SUMMARY

CASE 01


김수홍 원장

▸ Wifi-Mesh를 활용한 오픈 멤브레인 테크닉





CASE 02


김수홍 원장

▸ 볼륨업 임플란트



CASE 03


김수홍 원장

▸ 진피 이식과 볼륨업 임플란트



CASE 04


김수홍 원장

▸ 자가골을 활용한 골 및 치은 증대술

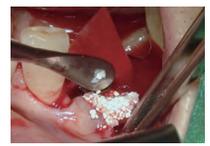


CASE 05


전인성 원장

▸ 코웰BMP와 WCC를 활용한 수평적 골유도재생술





CASE 06


전인성 원장

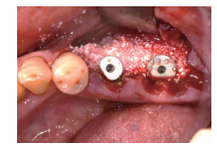
▸ 코웰BMP와 Wifi-Mesh를 활용한 치조제증대술



CASE 07


전인성 원장

▸ 즉시 식립 후 코웰BMP와 이종골을 활용한 GBR


CASE 08


전인성 원장

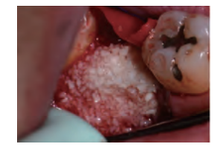
▸ 잔존 Fixture 제거 후 코웰BMP를 활용한 수직적 골증강술



CASE 09


박종환 원장

▸ 깊은 발치와에서 코웰BMP를 적용한 GBR의 결과


CASE 10


박종환 원장

▸ 코웰BMP를 활용한 전치부 치조골 & 연조직 폭 증대



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Osteoinductive Growth Factor

COWELL® BMP CLINICAL CASE SUMMARY

CASE 11

▸ 코웰BMP와 이종골 결합을 활용한 수직적 골증대술

CASE 12

▸ 코웰BMP를 활용한 Fixture가 노출된 구치부 연조직 증강술

CASE 13

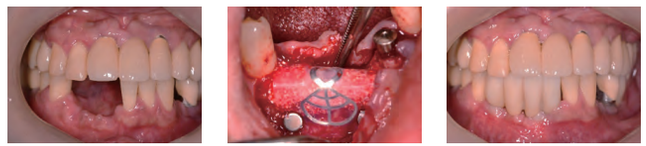
▸ 코웰BMP를 활용한 협면 연조직 증강술

CASE 14

▸ 코웰BMP와 동종골을 함께 활용한 GBR

CASE 15

▸ 코웰BMP 및 Wifi-Mesh를 활용한 GBR I

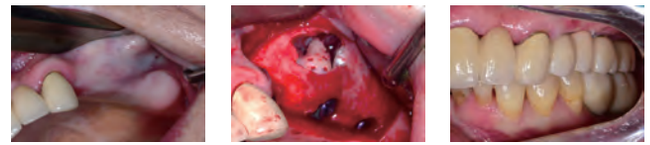


CASE 16

▸ 코웰BMP 및 Wifi-Mesh를 활용한 GBR II

CASE 17

▸ 블럭형 자가골 및 코웰BMP를 활용한 상악동 증대술



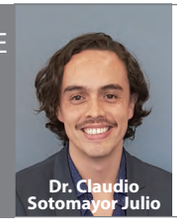
CASE 18

▸ 코웰BMP를 활용한 수직 및 수평 골증대술

CASE 19

▸ 코웰BMP를 활용한 골증대술

CASE 20



▸ 코웰BMP를 활용한 골 및 치은 재생술

CLINICAL CASE 01

서울 그대를위한치과
김 수 홍 원장

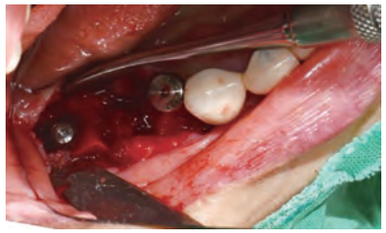
Wifi-Mesh를 활용한 오픈 멤브레인 테크닉

① 술전 교합면

② #45 INNO 임플란트 식립

③ #47 INNO 임플란트 식립

④ #45 힐링 어버트먼트 체결

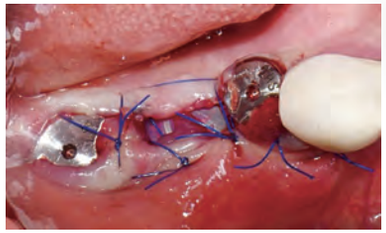


⑤ #46, 47 골결함

⑥ #45 골결함

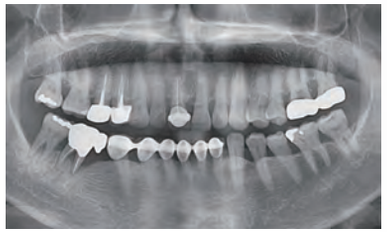
⑦ 코웰BMP 및 INNO-CaP 골이식

⑧ Wifi-Mesh로 골이식부 차폐

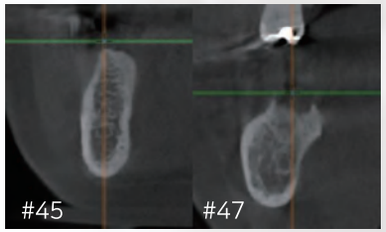


⑨ #46 오픈멤브레인 술식

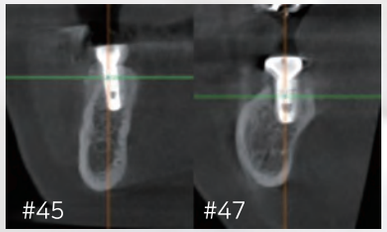
⑩ 코웰BMP 주입



술전 파노라마



술전 CT



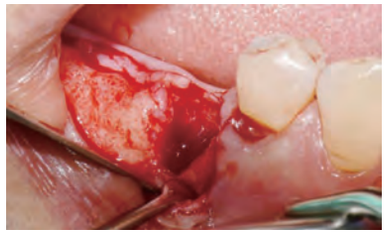
술후 CT

CLINICAL CASE 02

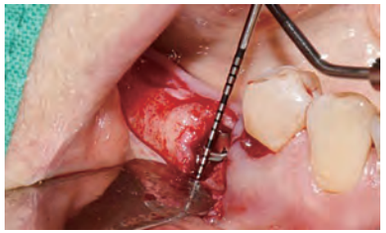
서울 그대를위한치과
김 수 홍 원장

볼륨업 임플란트

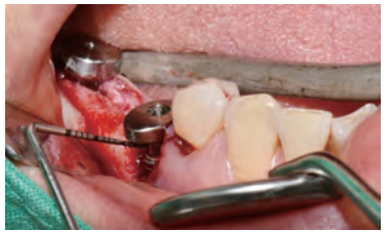
① 술전 교합면



② 발치와 결함



③ 임플란트와 협측골 사이 수직으로 3.5mm 결함



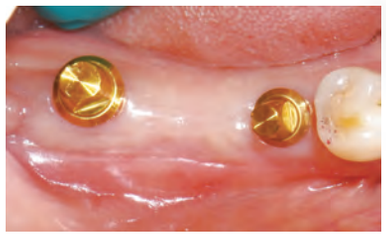
④ 임플란트와 협측골 사이 수평으로 3.5mm 결함

⑤ 코웰BMP 골이식재 이식

⑥ MegaDerm 이식

⑦ 술후 11주

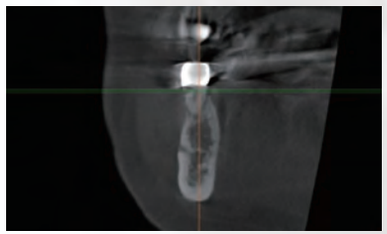
⑧ 술후 11주



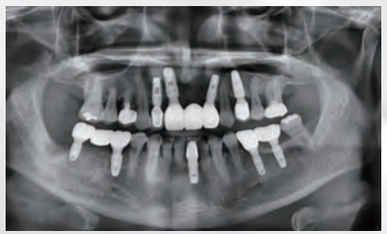
⑨ 술후 11주

⑩ 술후 12주

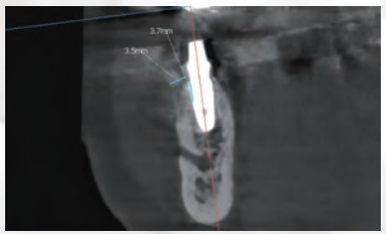
술전 파노라마



술전 CT



술후 파노라마



술후 CT

CLINICAL CASE 03

서울 그대를위한치과
김 수 홍 원장

진피 이식과 볼륨업 임플란트

① 술전 교합면

② 힐링 어버트먼트 게이지

③ 포인트 드릴

④ INNO 임플란트 식립

⑤ Ø8.5 힐링 어버트먼트 식립

⑥ 코웰BMP 골이식재 이식

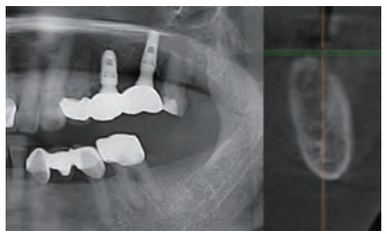
⑦ MegaDerm 이식

⑧ 봉합

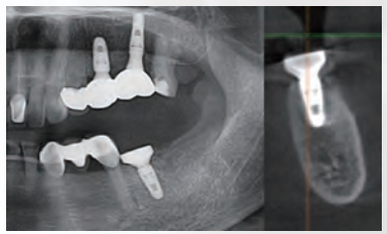
⑨ 술후 10일

⑩ 술후 4개월

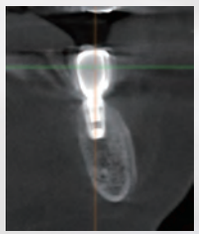
⑪ 최종 보철



술전 파노라마 및 CT



술후 파노라마 및 CT



술후 5개월 CT

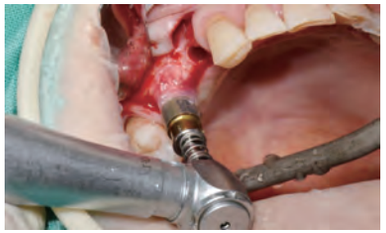
CLINICAL CASE 04

서울 그대를위한치과
김 수 홍 원장

자가골을 활용한 골 및 치은 증대술


① 술전 측면


② 오토본 하베스터 키트를 사용하여 #24에서 자가골 채취

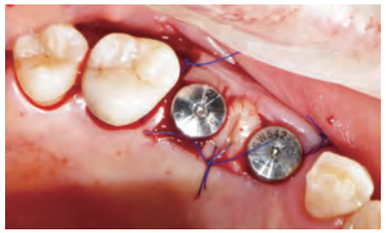

③ #26에서 자가골 채취


④ 채취 된 자가골을 본디쉬로 이동


⑤ 채취된 자가골


⑥ INNO 임플란트 식립 후 채취한 자가골 이식


⑦ 코웰BMP 주입


⑧ 술후


⑨ 술후 2주 교합면

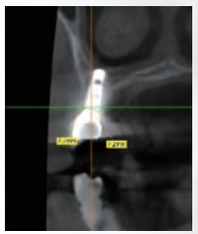

⑩ 술후 6주 교합면


⑪ 술후 8주 교합면


⑫ 술후 8주 교합면


술전 CT


술후 CT

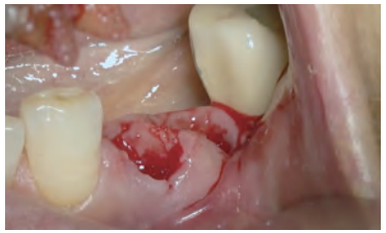

술후 3개월 CT

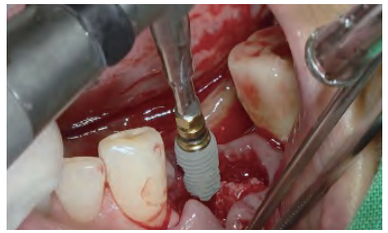
CLINICAL
CASE 05

서울 H치과
전 인 성 원장

코웰BMP와 WCC를 활용한 수평적 골유도재생술

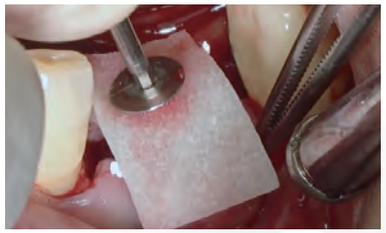

① 술전 교합면


② 발치 후


③ INNO Implant 식립

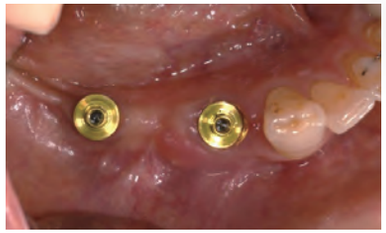

④ COWELL BMP 0.1g


⑤ BMP용액으로 수화시킨 ADM

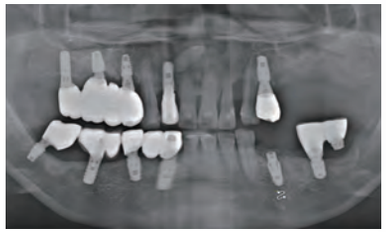

⑥ Wide Cover Cap으로 ADM 고정


⑦ Bone Grafting (BMP+InnoGraft B)


⑧ 봉합

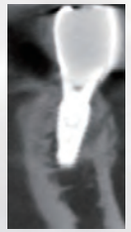

⑨ 2개월 후 Abutment 연결


⑩ 3개월 후 최종 보철


술전 파노라마


술후 파노라마


술후 CT

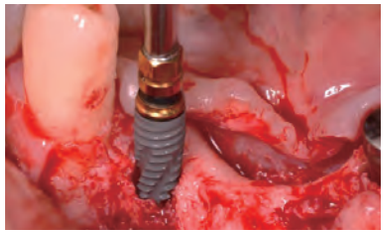

최종보철 CT

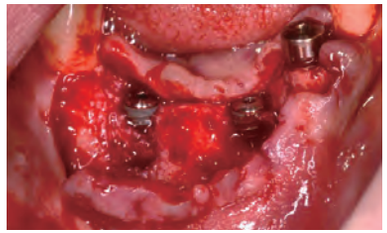
CLINICAL
CASE 06

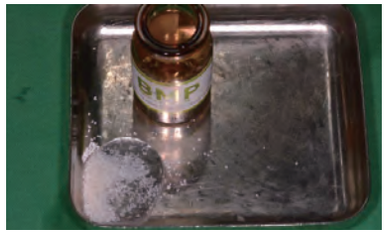
서울 H치과
전 인 성 원장

코웰BMP와 Wifi-Mesh를 활용한 치조제증대술

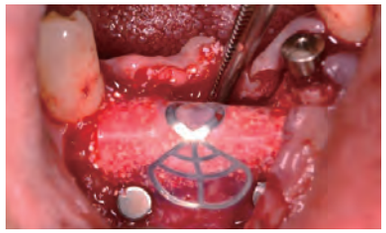

① 술전 전면

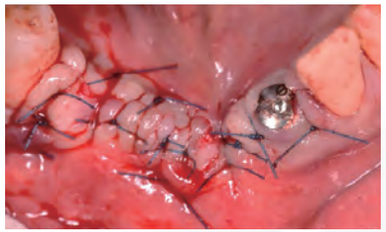

② INNO Implant 식립


③ 식립후



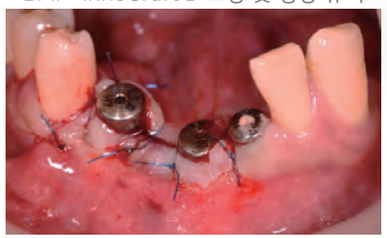
④ COWELL BMP 0.1g


⑤ 비흡수성 차폐막 (Wifi-Mesh)로
BMP+InnoGraft B 고정 및 형상 유지


⑥ 봉합


⑦ 술후 1주


⑧ 술후 1개월

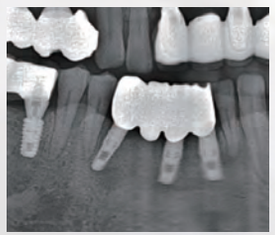

⑨ 술후 2개월 2차 수술


⑩ Abutment 연결


⑪ 최종 보철


술전 파노라마


술후 파노라마

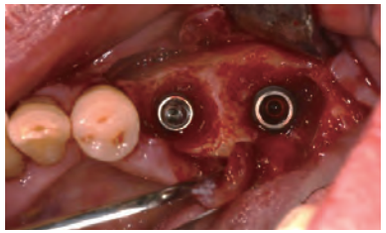

최종보철

CLINICAL CASE 07

서울 H치과
전 인 성 원장

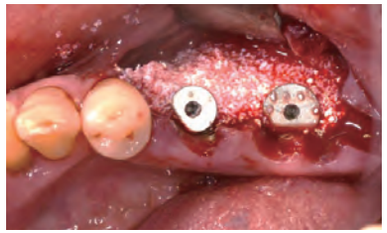
즉시 식립 후 코웰BMP와 이종골을 활용한 GBR

① 술전 측면



② INNO Implant 식립

③ COWELL BMP 0.1g



④ BMP를 적용한 InnoGraft B 골이식

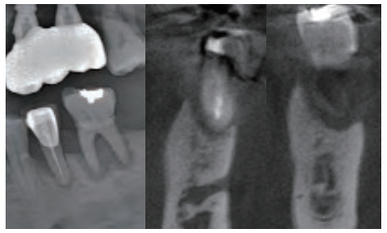
⑤ 봉합

⑥ 술후 1개월

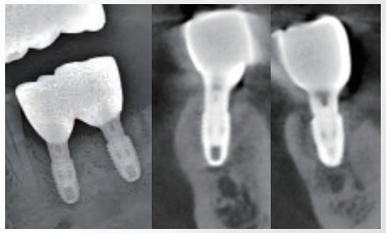
⑦ 술후 2개월

⑧ 최종 인상체득

⑨ 술후 3개월 최종 보철물



술전 파노라마 및 CT



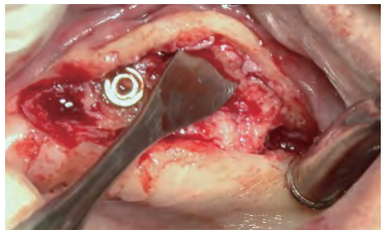
최종보철 파노라마 및 CT

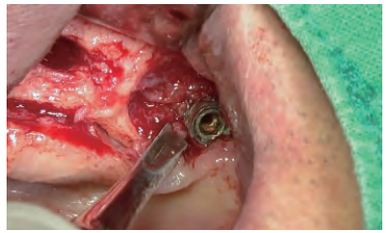
CLINICAL
CASE 08

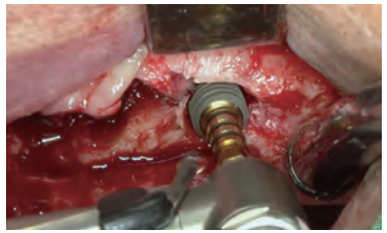
서울 H치과
전 인 성 원장

잔존 Fixture 제거 후 코웰BMP를 활용한 수직적 골증강술


① 술전 전면


② 절개 및 박리


③ 기존 임플란트 제거


④ INNO Implant 식립
(#13~#16, #23~#26)

⑤ COWELL BMP 0.1g


⑥ COWELL BMP를 적용한
InnoGraft B로 골이식


⑦ ADM (메가덤) Cover

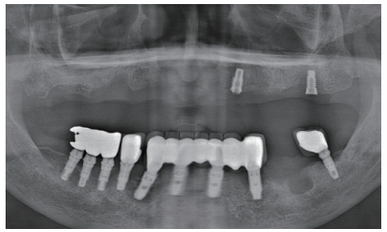

⑧ 봉합

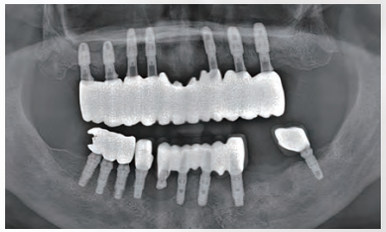

⑨ 술후 1개월


⑩ 임시 브릿지 장착


⑪ 술후 3개월 Abutment 연결


⑫ 최종 보철


술전 파노라마

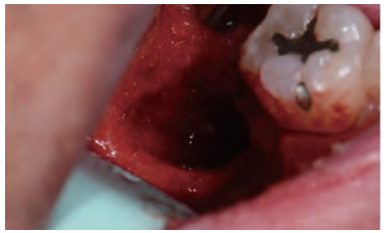

술후 파노라마

CLINICAL CASE 09

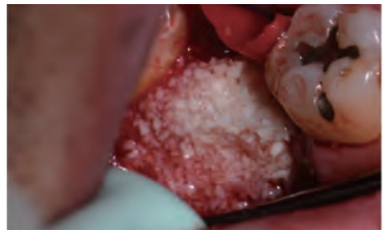
울산 허브치과
박 종 환 원장

깊은 발치와에서 코웰BMP를 적용한 GBR의 결과

① 발치 후



② 절개 후 판막 거상



③ 동종골 이식 후 BMP 적용

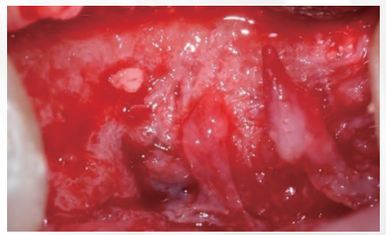
④ 발치와로부터 채취한
육아조직으로 덮고 봉합

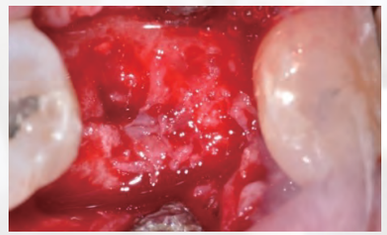
⑤ 1주 후

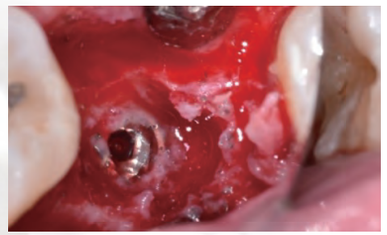
⑥ 5주 후

⑦ 4개월 후

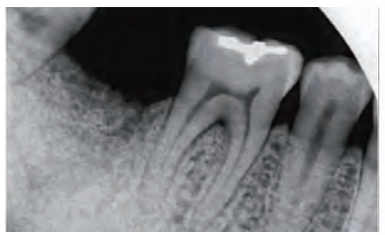
⑧ 6개월 후





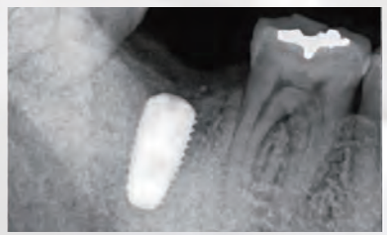


⑨ GBR 후 6개월 2차 수술



술전

BMP 적용한 GBR



INNO Implant

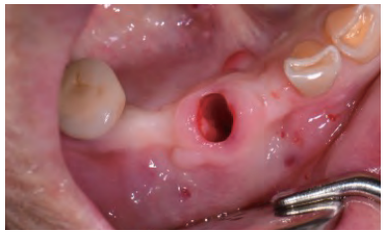
2차 수술 후

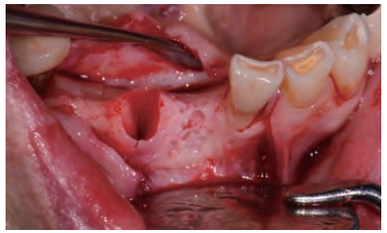
CLINICAL CASE 10

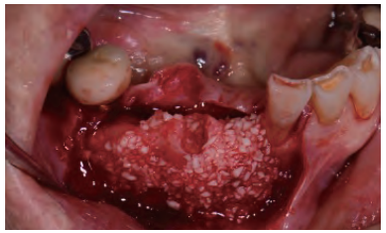
울산 허브치과
박 종 환 원장

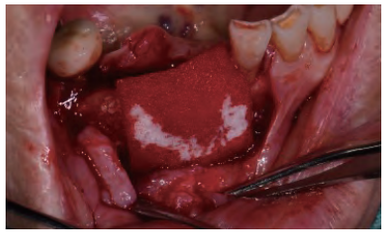
코웰BMP를 활용한 전치부 치조골 & 연조직 폭 증대


① 술전


② 발치 후


③ Releasing Incision


④ 수화시킨 BMP 적용


⑤ ADM (MegaDerm) 고정


⑥ 가철성 임시치아


⑦ 10일 후

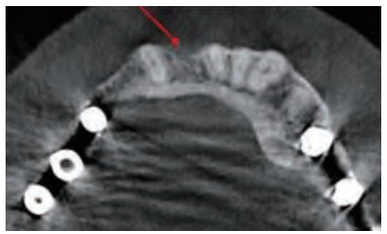

⑧ 5주 후

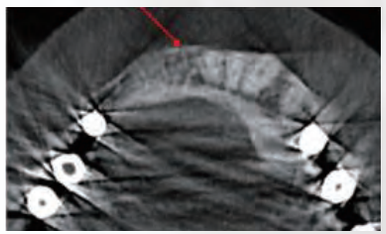

⑨ 식립 후


⑩ 식립 당일 임시치아 세팅


⑪ 최종 보철 장착


⑫ 보철 장착 4주 후


술전 CT

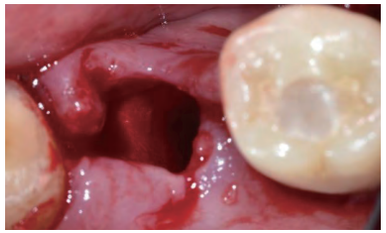

술후 CT

CLINICAL
CASE 11

울산 **허브치과**
박 종 환 원장

코웰BMP와 이종골 결합을 활용한 수직적 골증대술

① 술전

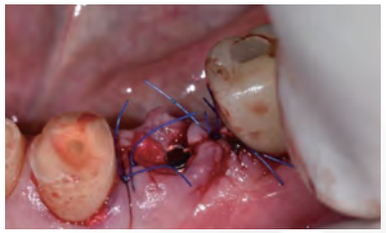


② 발치 후

③ Flap 후 INNO Implant 식립

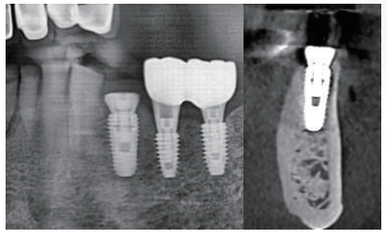
④ BMP 적용 후 Bone Grafting
(InnoGraft B)

⑤ ADM 고정



⑥ 술후

⑦ 1일 후



술후 파노라마 및 CT

술후 CT
(전면)

CLINICAL
CASE 12

울산 **허브치과**
박 종 환 원장

코웰BMP를 활용한 Fixture가 노출된 구치부 연조직 증강술


① 술전


② 술전 교합면
(Fixture 노출)


③ 절개

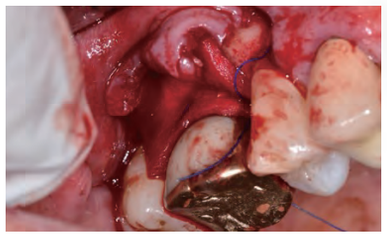

④ 절개 후 Flap

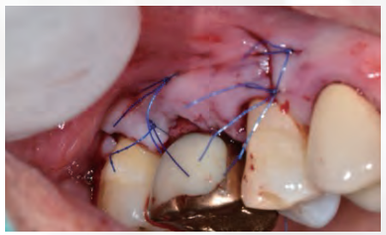

⑤ Fixture 주변 염증 조직 제거


⑥ Bone 흡수 관찰됨


⑦ BMP 용액 & ADM (MegaDerm)


⑧ ADM (MegaDerm) 이식


⑨ Sling Suture


⑩ 술후


⑩ 1일 후


⑩ 10일 후

CLINICAL
CASE 13

울산 **허브치과**
박 종 환 원장

코웰BMP를 활용한 협면 연조직 증강술

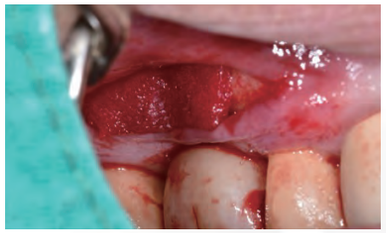

① 술전

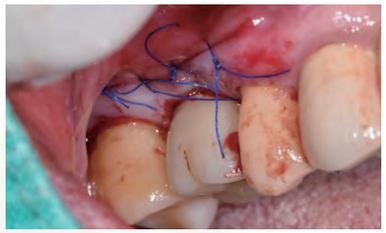

② 술전 교합면


③ Flap 후 골융기 제거


④ 협면 골융기 제거 후


⑤ 수화시킨 BMP 용액을 적용한 ADM


⑥ ADM 이식 후


⑦ 술후


⑧ 술후 교합면


⑨ 1주일 후


⑩ 1개월 후


⑪ 1개월 후 교합면

CLINICAL CASE 14

울산 허브치과
박 종 환 원장

코웰BMP와 동종골을 함께 활용한 GBR

① 술전

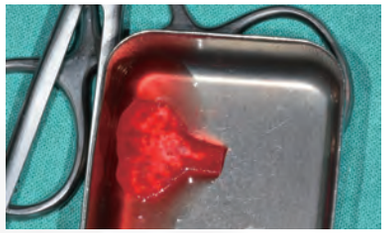
② 절개

③ Flap 후 치은 박리

④ Granulation tissue 제거

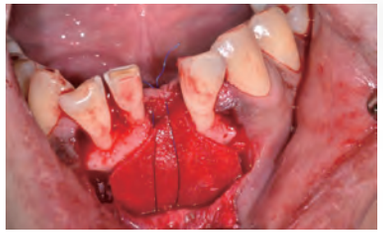
⑤ BMP 0.1g & MegaDerm(ADM)

⑥ MegaDerm 접합



⑦ MegaDerm에 수화시킨
BMP 용액 적용

⑧ Bone Grafting (동종골)



⑨ MegaDerm 고정 및 봉합

⑩ 술후

⑪ 술후 교합면

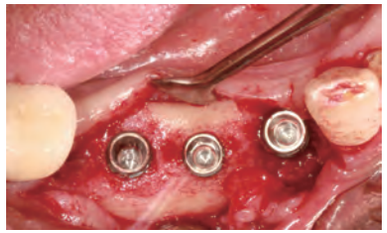
⑫ 술후 6주

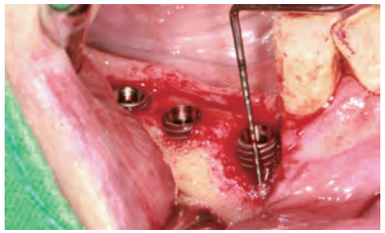
CLINICAL
CASE 15

가디언즈 치과
정 명 진 원장

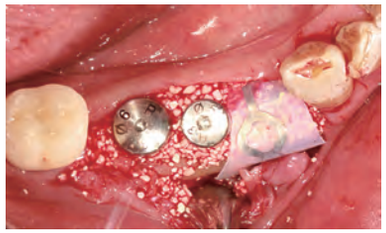
코웰BMP 및 Wifi-Mesh를 활용한 GBR I

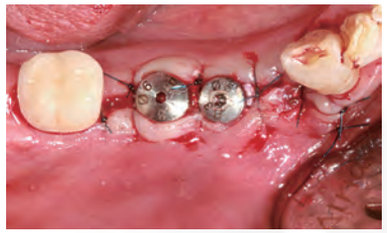

① 술전 교합면

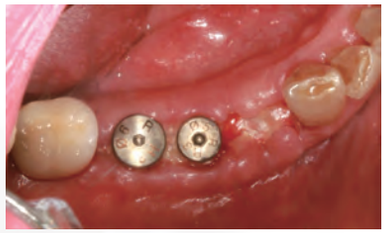

② 임플란트 식립


③ 수직골 결함


④ 코웰BMP 골이식재 이식


⑤ Wifi-Mesh로 결함 부위 차폐


⑥ 1차 봉합


⑦ 신생골 생성 후 결함 부위 치유


⑧ 인상 채득


⑨ 임시 치아


⑩ 어버트먼트 체결 후 측면


⑪ 최종 보철


⑫ 술후 측면


술전 파노라마

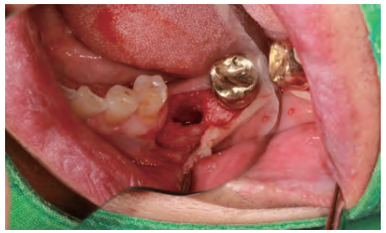

술전 CT

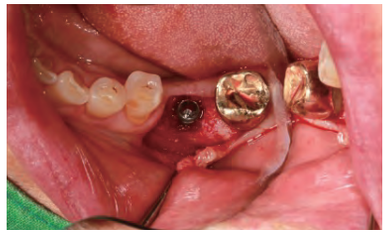
CLINICAL
CASE 16

가디언즈 치과
정 명 진 원장

코웰BMP 및 Wifi-Mesh를 활용한 GBR II

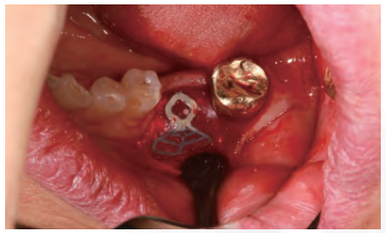

① 술전


② 절개 후 드릴링

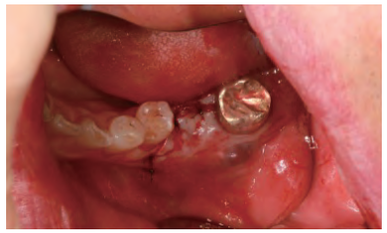

③ INNO Implant 식립

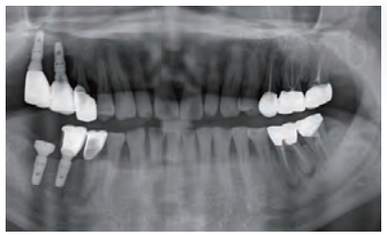
④ COWELL BMP 0.1g & Wifi-Mesh

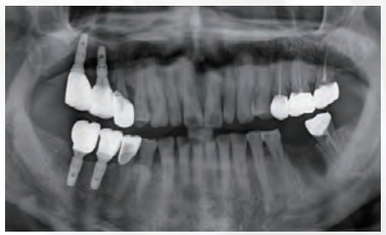

⑤ BMP 용액을 적용한 합성골 이식

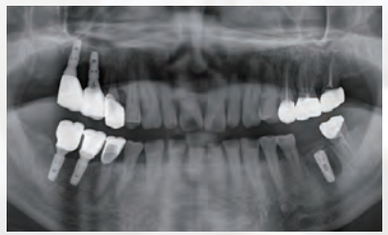

⑥ Wifi-Mesh 로 골이식부 지지

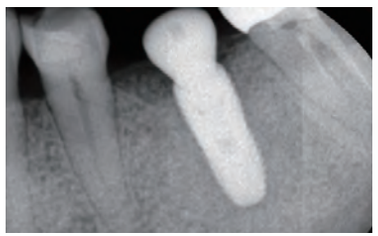

⑦ PRF(자가혈소판) 이식


⑧ 봉합

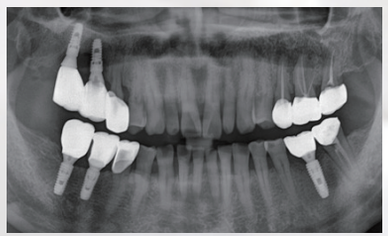

술전 파노라마


발치 후


INNO Implant 식립 후


술후 2개월 2차 수술


술후 3개월

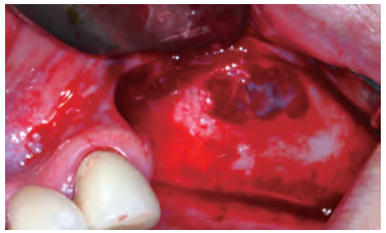

최종보철

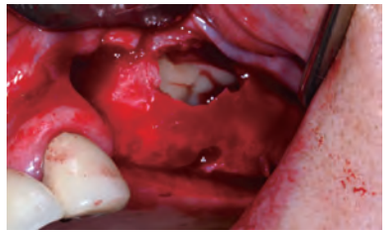
CLINICAL
CASE 17

대전 장호열치과
장 호 열 원장

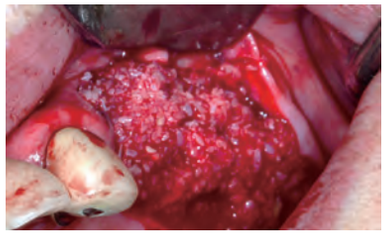
블럭형 자가골 및 코웰BMP를 활용한 상악동 증대술

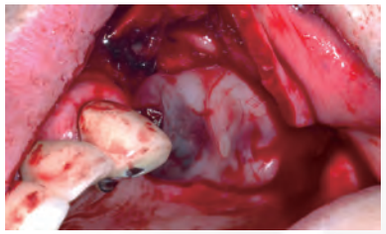

① 술전 측면

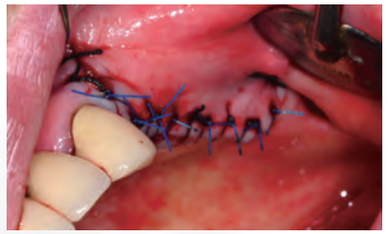

② 측방 형성 및 상악동막 노출


③ 2겹의 CGF로 상악동천공 차폐

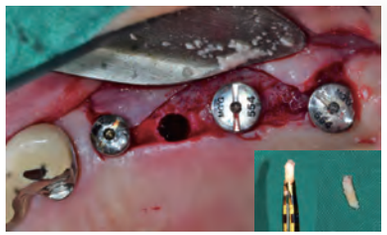

④ 코웰BMP로 농축된 블록형 자가골을 상악동에 채운 뒤 즉시 임플란트 식립


⑤ 자가골 덩어리로 3D증대


⑥ CGF 이식


⑦ 1차 봉합

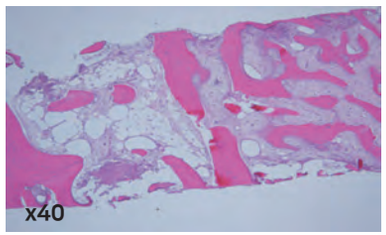

⑧ 2차 수술을 위한 거상술


⑨ #25 골 샘플 채취

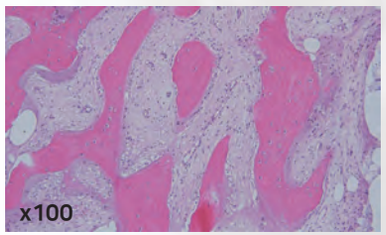

⑩ 봉합


⑪ 맞춤형 어버트먼트 및 풀지르코니아 보철


⑫ 술후 측면

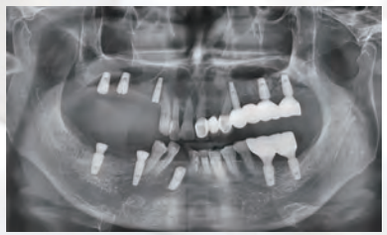


H&E stain



H&E stain


술전 파노라마

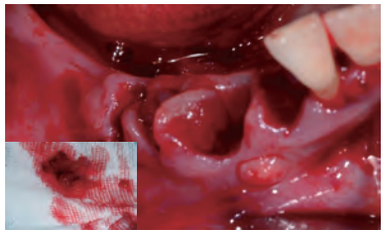

술후 파노라마

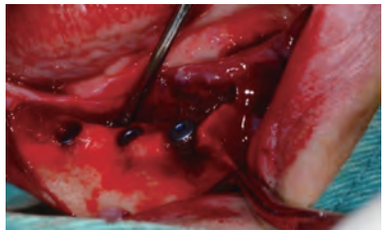
CLINICAL
CASE 18

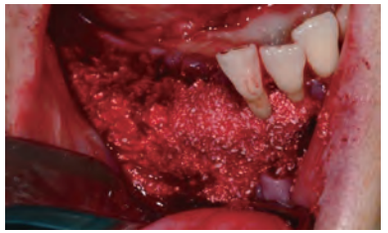
대전 장호열치과
장 호 열 원장

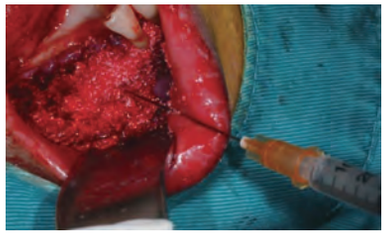
코웰BMP를 활용한 수직 및 수평 골증대술

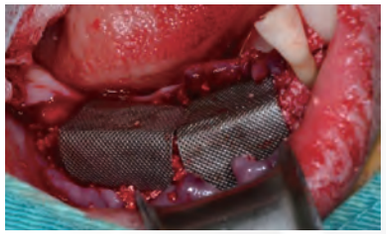

① 술전 측면

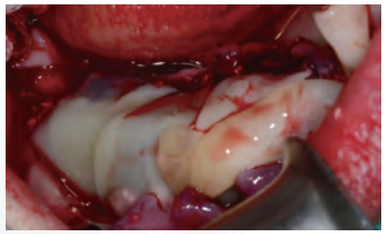

② 발치 및 염증 조직 제거

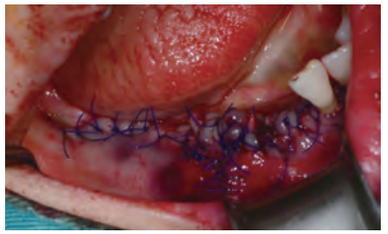

③ #45, 46, 47 임플란트 식립

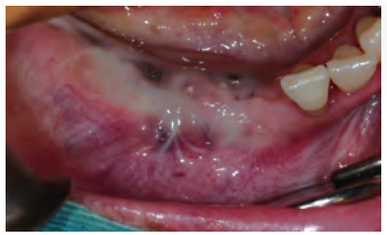

④ 동종골 및 합성골이식으로
수평 및 수직 골증대

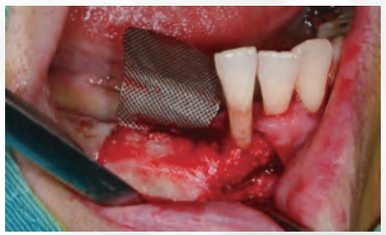

⑤ 코웰BMP 주입

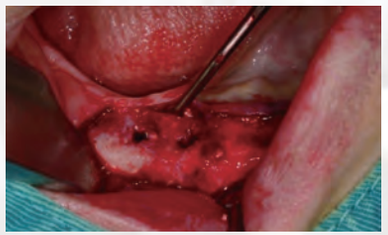

⑥ Ti-Mesh 이식

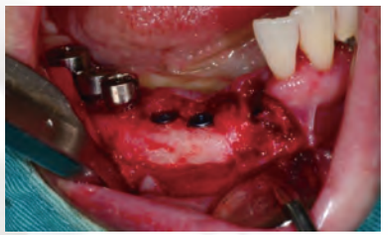

⑦ CGF로 차폐

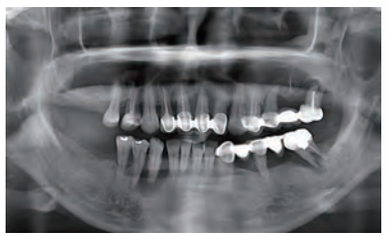

⑧ 1차 봉합


⑨ 2차 술전


⑩ Ti-Mesh 제거

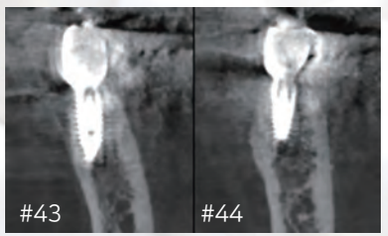

⑪ #45, 46, 47 2차 수술


⑫ #41, 43, 44 임플란트 식립


술전 파노라마


보철 후 파노라마


술후 8년 파노라마



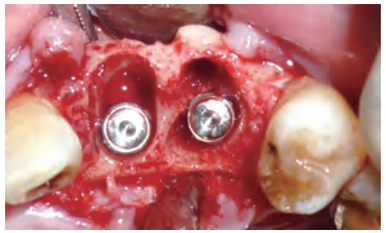
술후 8년 CT

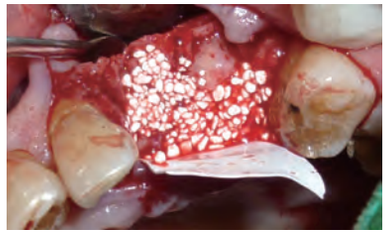
CLINICAL
CASE 19

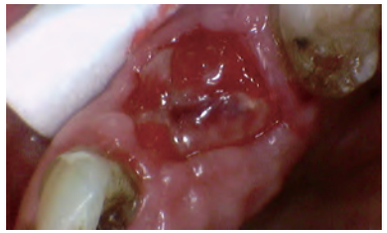
서울 스타티스1치과
김 우 형 원장

코웰BMP를 활용한 골증대술


① 술전 측면

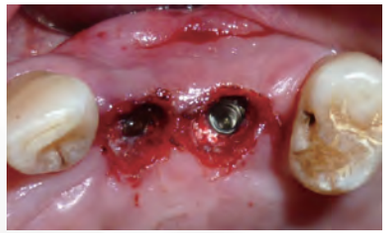

② INNO 임플란트 식립


③ 코웰BMP, 동종골, 이종골, 합성골 이식 후 비흡수성 차폐막으로 차폐

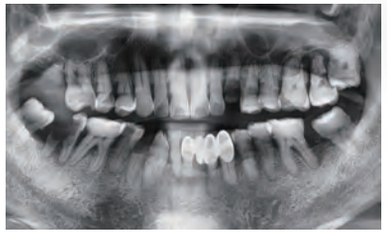

④ 비흡수성 차폐막 제거

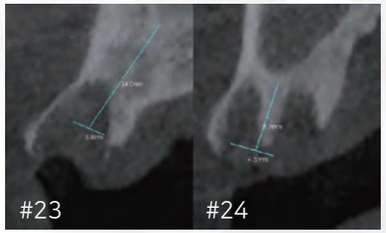

⑤ 치유


⑥ 힐링 어버트먼트

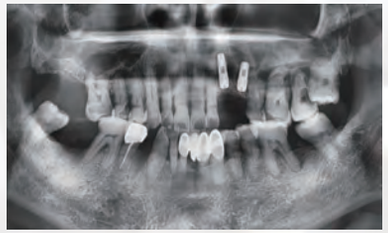

⑦ 힐링 어버트먼트 제거

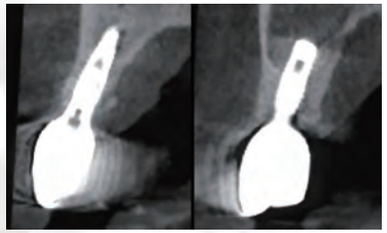

⑧ 술후 6개월


술전 파노라마



술전 CT


술후 파노라마

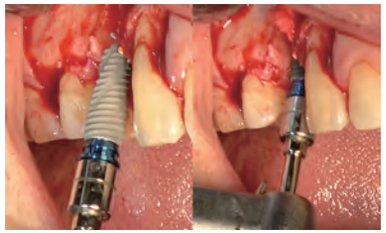

술후 6개월 CT

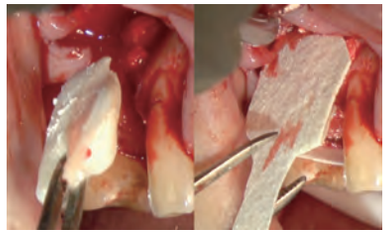
CLINICAL
CASE 20

Chile
Dr. Claudio Sotomayor
Julio, D.D.S.

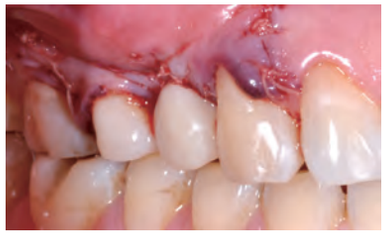
코웰BMP를 활용한 골 및 치은 재생술


① 술전 측면


② INNO 임플란트 식립

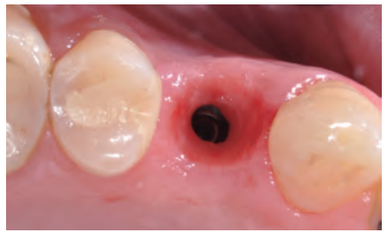

③ 코웰BMP BCP 파우더를 묻힌
2겹의 멤브레인 이식


④ 코웰BMP 주입


⑤ 술후 측면


⑥ 술후 1개월 측면


⑦ 술후 4개월 브릿지 치아 제거

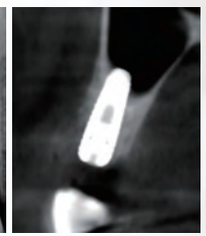

⑧ 브릿치 치아 제거 후 2주


⑨ 최종 보철 후 5개월 측면


⑩ 최종 보철 후 5개월 교합면


술전 (18. 08. 02)


술후 (18. 08. 02)


술후 4개월
(18. 12. 03)


술후 1년
(19. 08. 06)

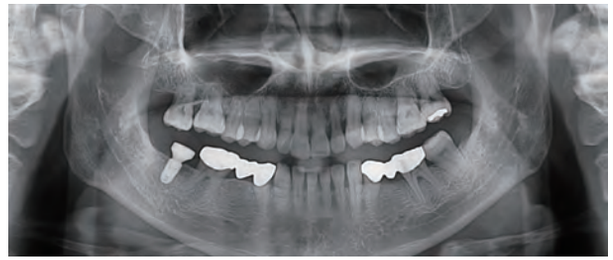
CLINICAL **CASE 21**

Contracted gingival restoration without a bone graft

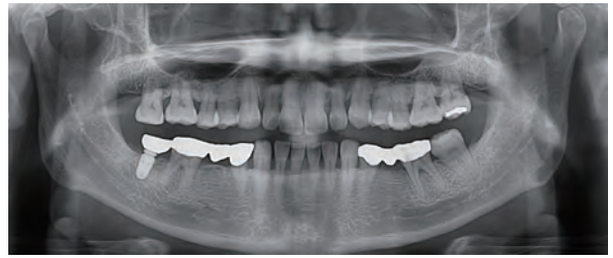
51 years old, Female

Preoperative
2010. 01. 22

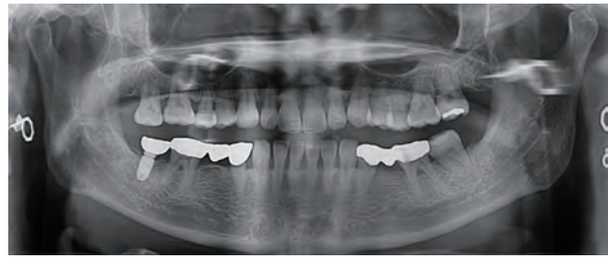
Postoperative
2010. 01. 22



7 months
2010. 08. 20



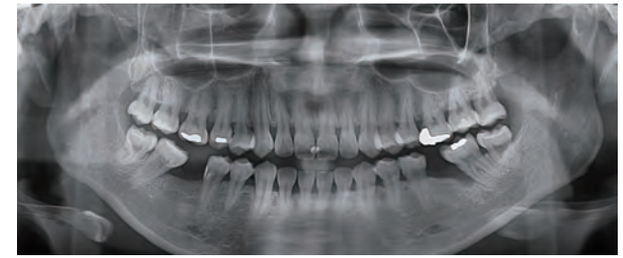
2019. 02. 20



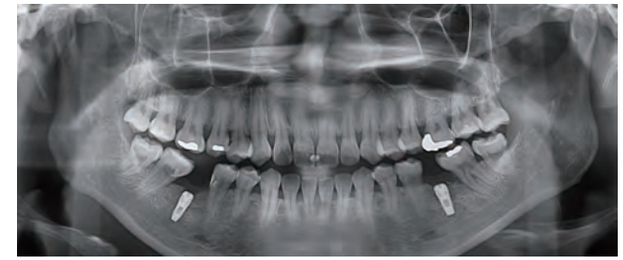
CLINICAL **CASE 22**

Vertical augmentation in mandibular

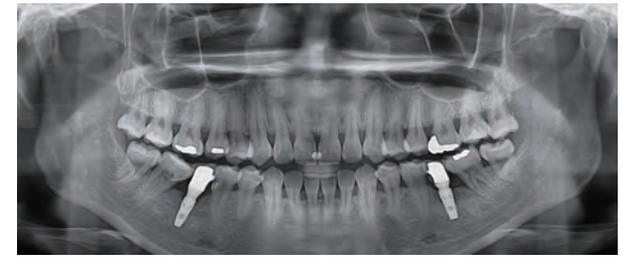
35 years old, Female



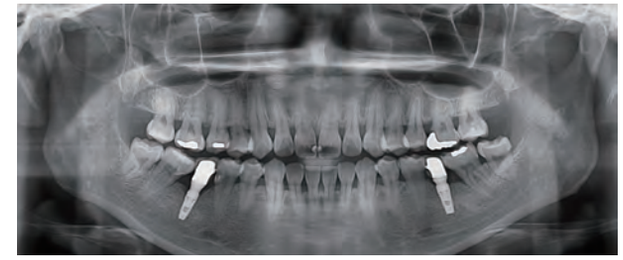
Preoperative
2010. 02. 01



Postoperative
2010. 02. 22



5 months
2010. 07. 20

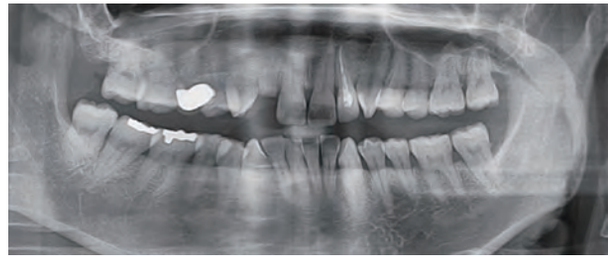


2019. 03. 27

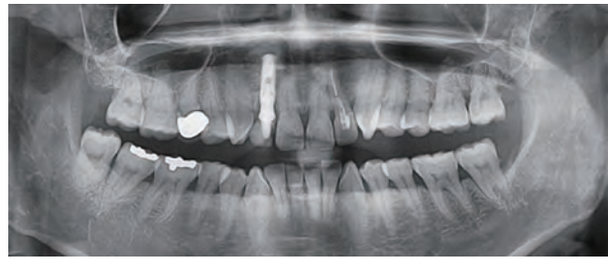
CLINICAL **CASE 23**

Tunnel bone graft

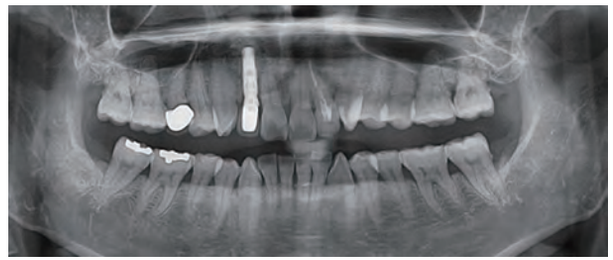
52 years old, Female



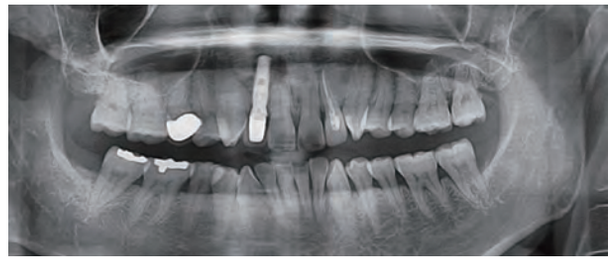
Preoperative
2010. 02. 19



Postoperative
2010. 02. 19



6 months
2010. 08. 13

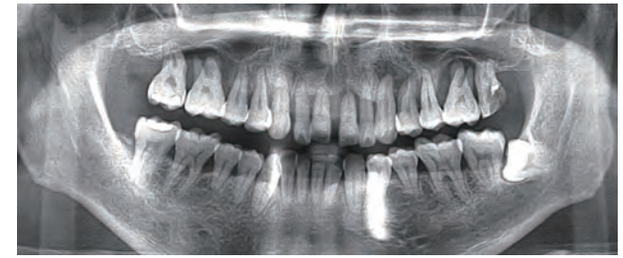


2019. 02. 11

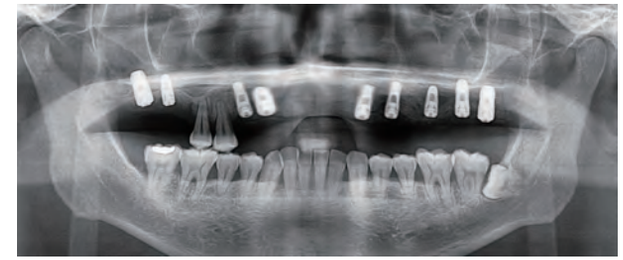
CLINICAL **CASE 24**

Vertical bone augmentation

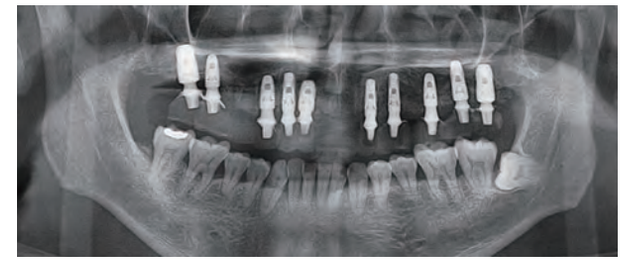
35 years old, Male



Preoperative
2010. 02. 23



Postoperative
2010. 06. 30



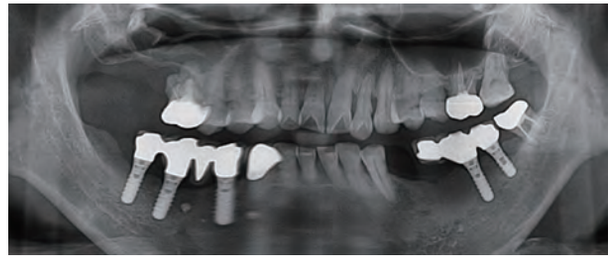
5 months
2010. 11. 24

2019. 01. 10

CLINICAL **CASE 25**

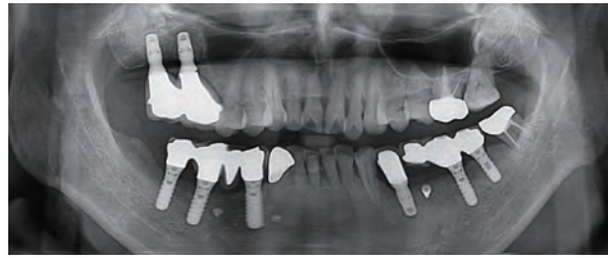
Lateral bone graft

62 years old, Male



Preoperative
2010. 02. 25

Postoperative
2011. 10. 17



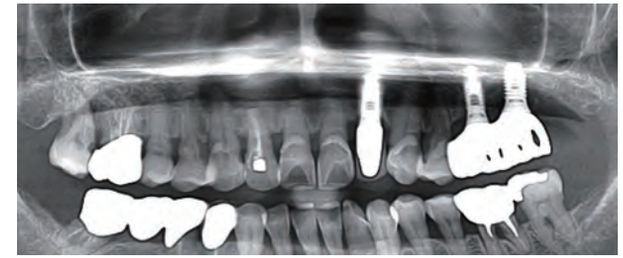
1 year 4 months
2013. 02. 04

2019. 01. 17

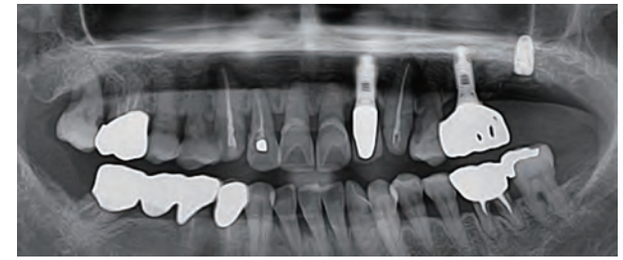
CLINICAL **CASE 26**

Vertical bone graft

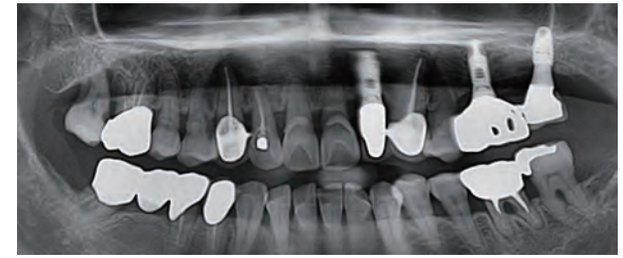
66 years old, Female



Preoperative
2010. 03. 12



Postoperative
2010. 08. 06



7 months
2011. 03. 21

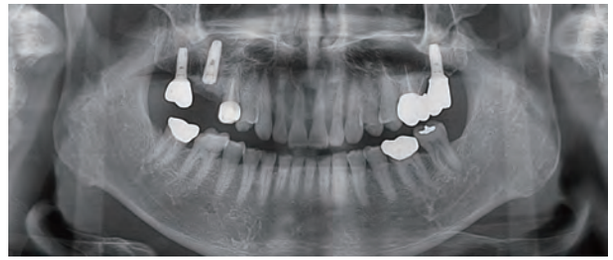
2019. 03. 08

CLINICAL **CASE 27**

Regeneration using open sheet technique

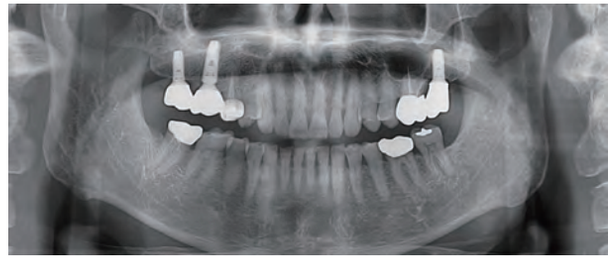
59 years old, Male

Preoperative
2010. 03. 12



Postoperative
2010. 03. 22

7 months
2010. 10. 19

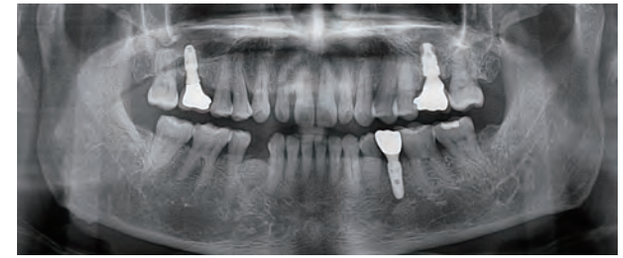


2019. 01. 24

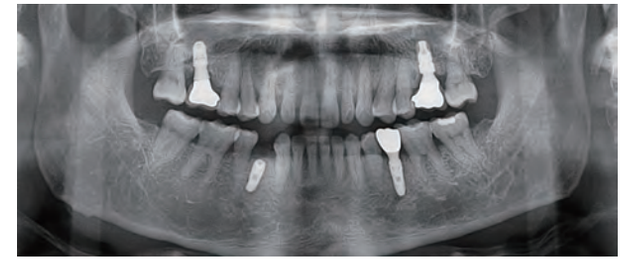
CLINICAL **CASE 28**

Buccal bone graft in mandibular premolar

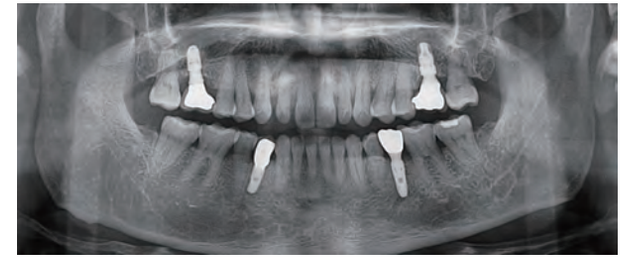
60 years old, Male



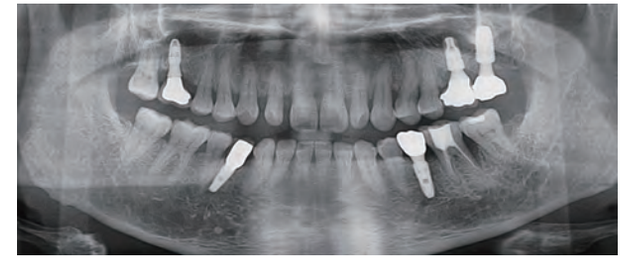
Preoperative
2010. 03. 22



Postoperative
2010. 03. 22



4 months
2010. 07. 05



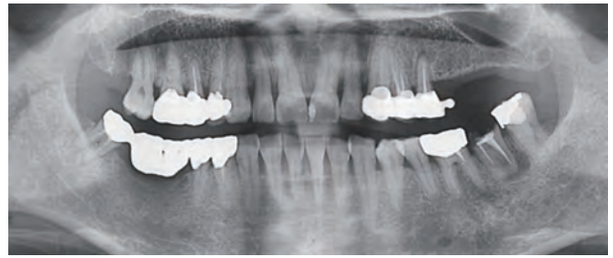
2019. 01. 25

CLINICAL **CASE 29**

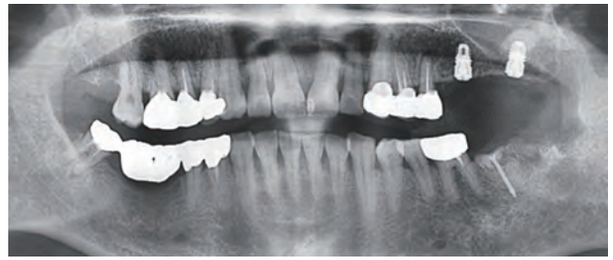
Autobone graft with rhBMP-2

60 years old, Female

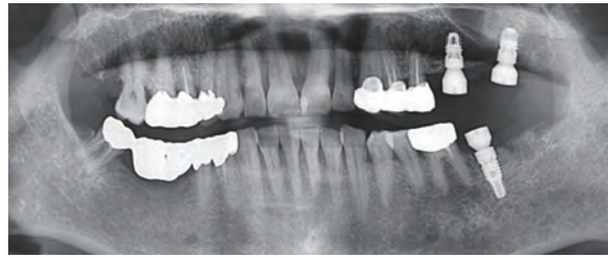
Preoperative
2010. 03. 24



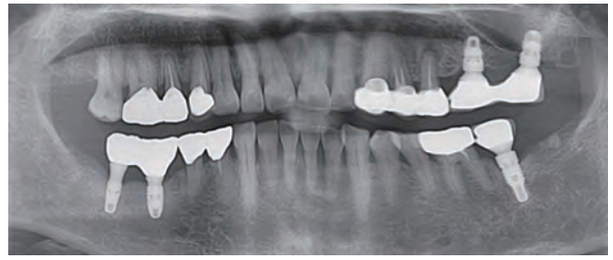
Postoperative
2010. 07. 09



3 months
2010. 10. 25



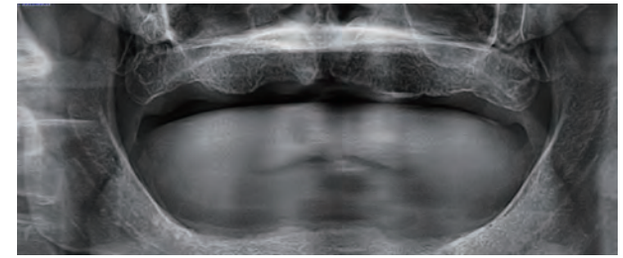
2019. 03. 07



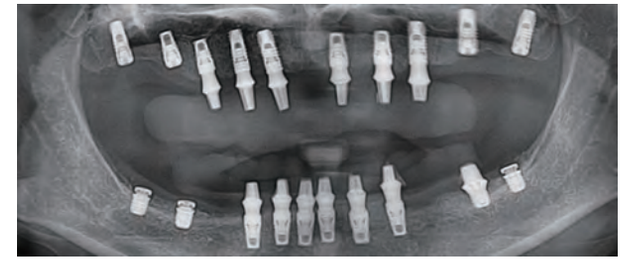
CLINICAL **CASE 30**

Bone regeneration in combination of rhBMP-2 and autogenous bone

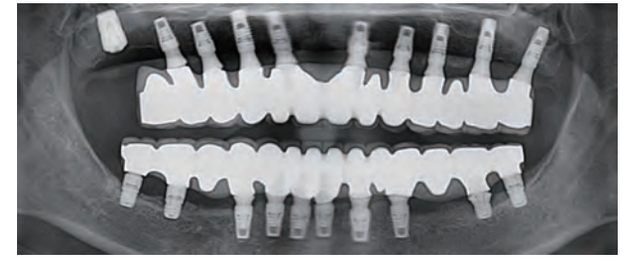
62 years old, Female



Preoperative
2010. 04. 05



Postoperative
2010. 04. 05



10 months
2011. 02. 25

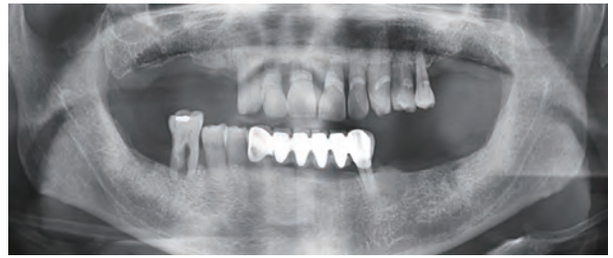
2019. 01. 18

CLINICAL **CASE 31**

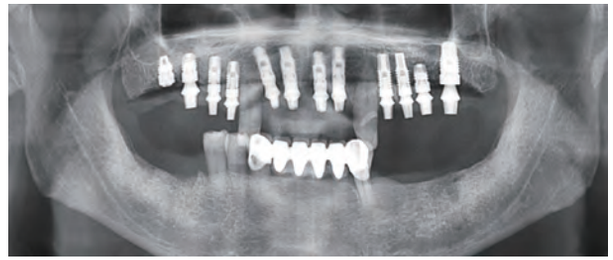
Staged implantation in healed ridge and extraction socket

63 years old, Male

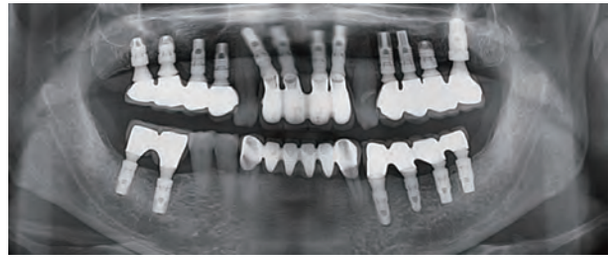
Preoperative
2010. 04. 06



Postoperative
2010. 04. 30



9 months
2011. 01. 19

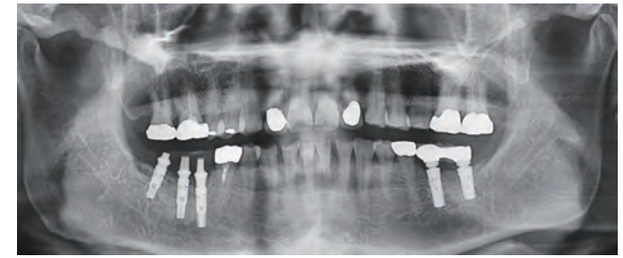


2019. 01. 08

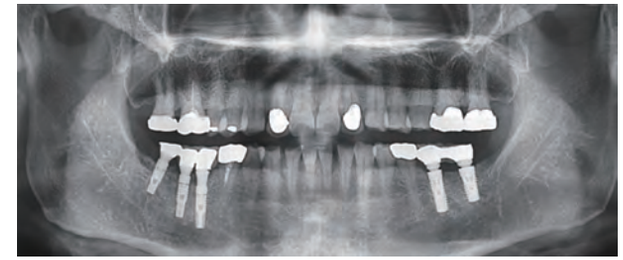
CLINICAL **CASE 32**

Autobone block and implant with rhBMP-2 in socket

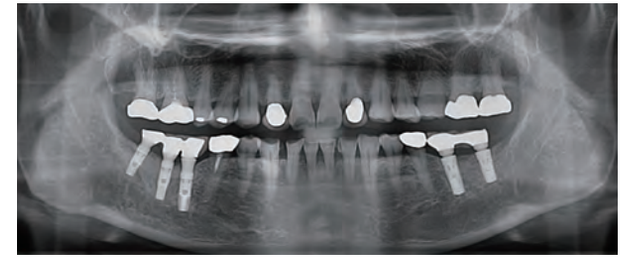
63 years old, Female



Postoperative
2010. 04. 07



2 months
2010. 06. 03



2 year 1 months
2012. 07. 26

2019. 01. 23

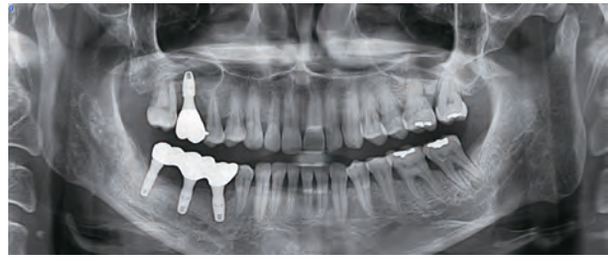
CLINICAL **CASE 33**

Vertical augmentation using tenting screw

53 years old, Female

Preoperative
2010. 04. 08

Postoperative
2010. 04. 20



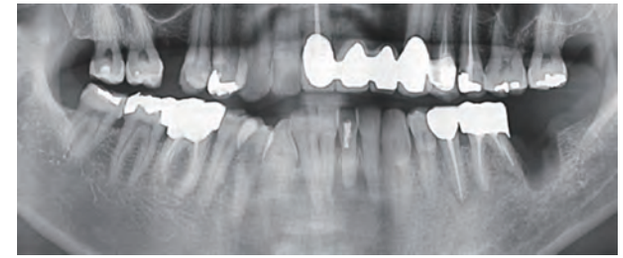
6 months
2010. 10. 29

2019. 02. 13

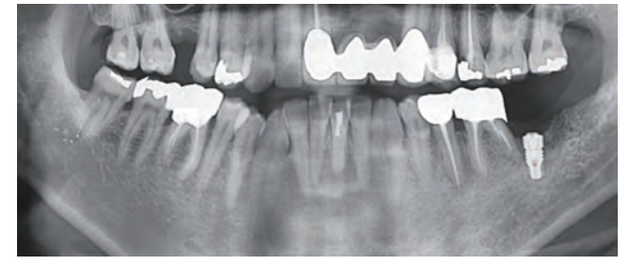
CLINICAL **CASE 34**

Autobone graft with rhBMP-2

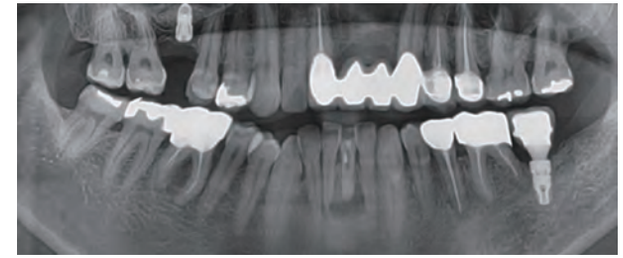
51 years old, Male



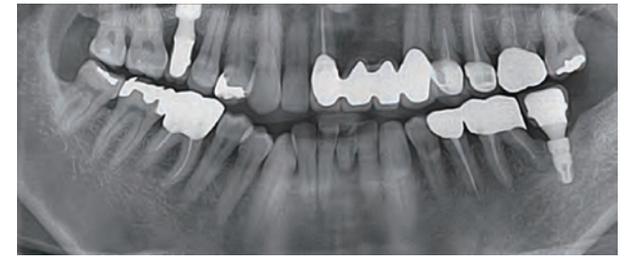
Preoperative
2010. 04. 10



Postoperative
2010. 09. 17



5 months
2011. 02. 18



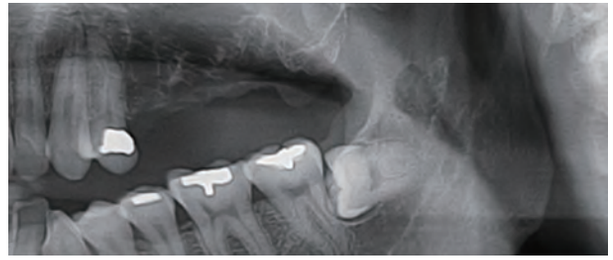
2019. 01. 22

CLINICAL **CASE 35**

Socket and sinus graft

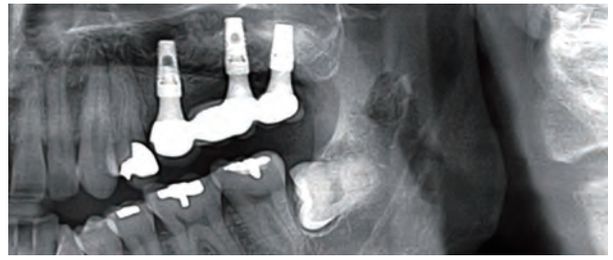
35 years old, Male

Preoperative
2010. 04. 12



Postoperative
2010. 04. 19

5 months
2010. 09. 14

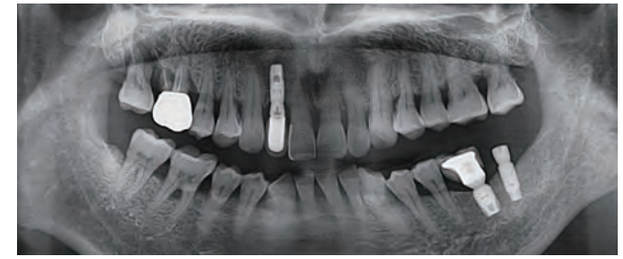


2019. 04. 10

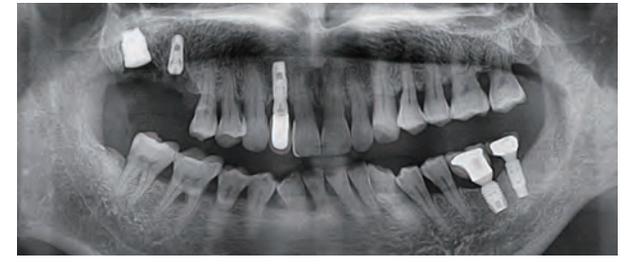
CLINICAL **CASE 36**

Open wound healing

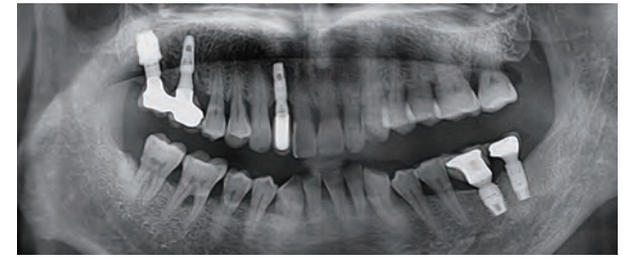
72 years old, Male



Preoperative
2010. 04. 14



Postoperative
2010. 04. 21



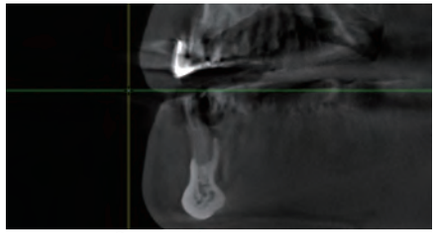
5 months
2011. 08. 08

2019. 04. 01

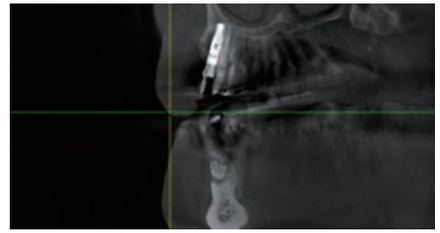
CLINICAL **CASE 37**

Bone regeneration in staged implantation

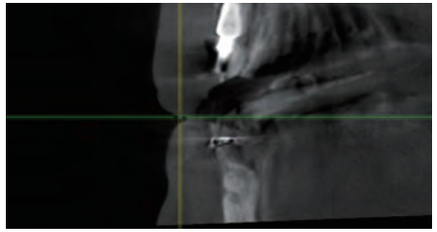
51 years old, Male



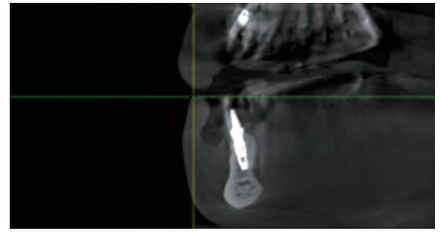
Preoperative *2010. 04. 28*



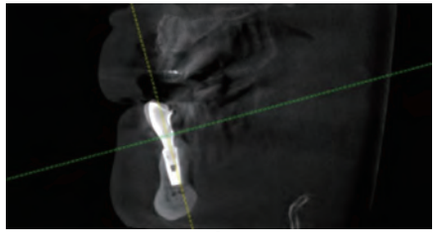
Postoperative *2010. 04. 28*



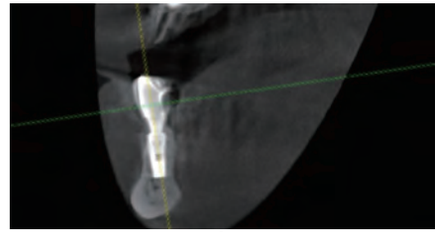
5 months *2010. 09. 20*



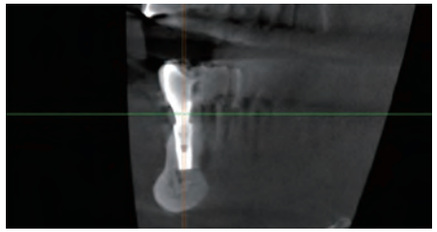
8 months *2010. 12. 06*



4 year 1 months *2014. 06. 09*



5 year 5 months *2015. 10. 05*

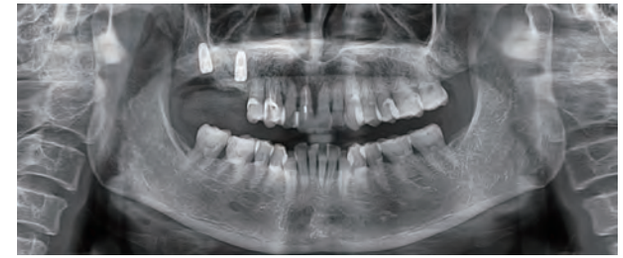


2019. 03. 22

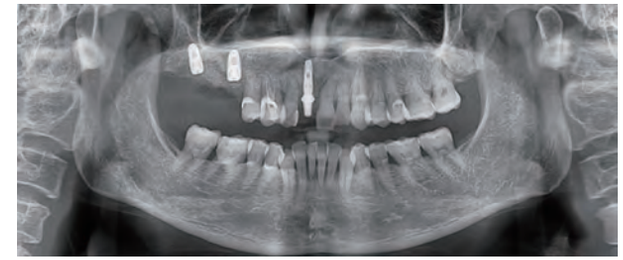
CLINICAL **CASE 38**

Immediate implantation, bone graft and temporarization

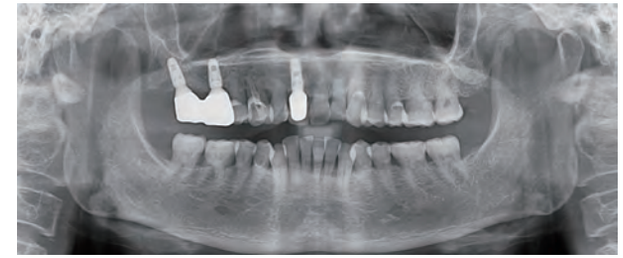
55 years old, Female



Postoperative
2010. 05. 10



Postoperative
2010. 05. 31



1 year 7 months
2011. 12. 05

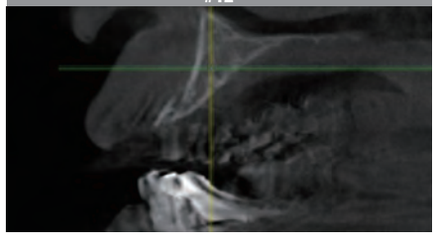
2019. 04. 08

CLINICAL **CASE 39**

Buccal bone graft

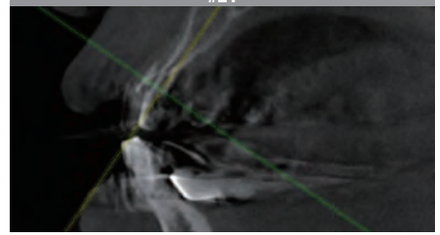
70years old, Female

#12

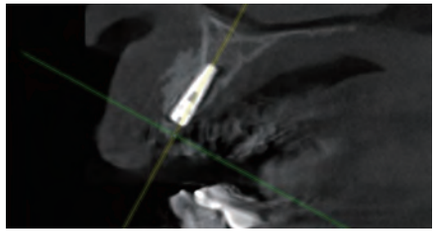


2010. 05. 26

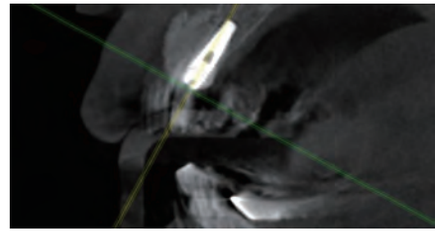
#21



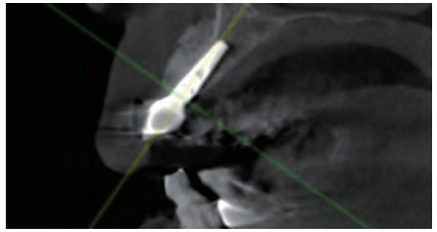
2010. 05. 26



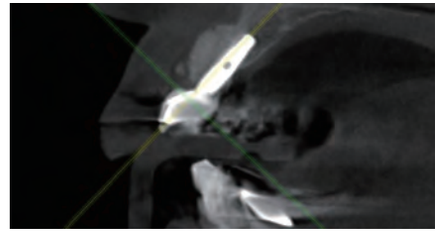
2010. 07. 09



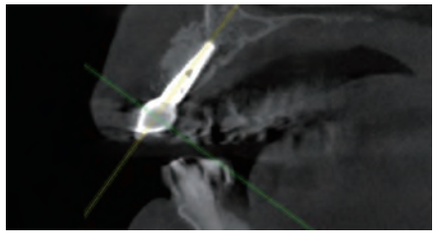
2010. 07. 09



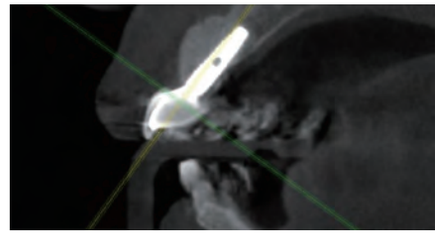
2011. 01. 05



2011. 01. 05



2019. 04. 04

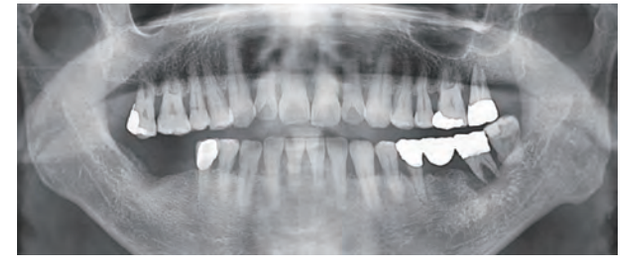


2019. 04. 04

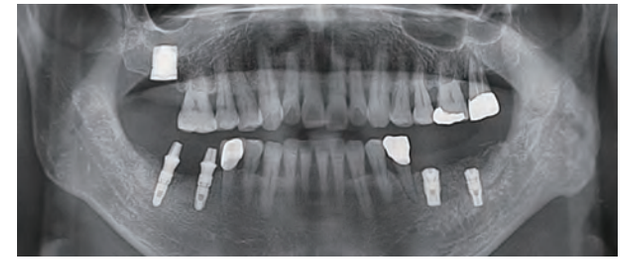
CLINICAL **CASE 40**

Bone graft with rhBMP-2

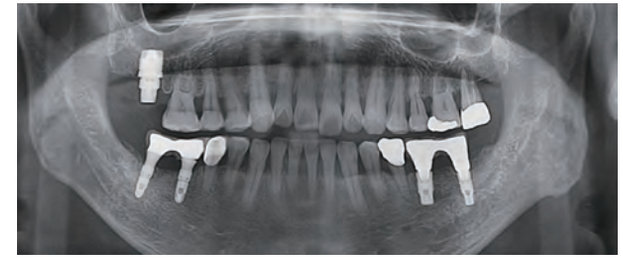
64 years old, Male



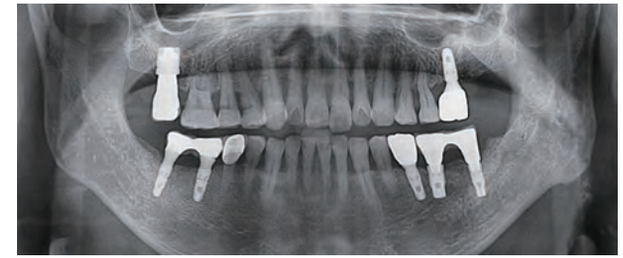
Preoperative
2010. 06. 23



Postoperative
2011. 01. 17



5 months
2011. 06. 01

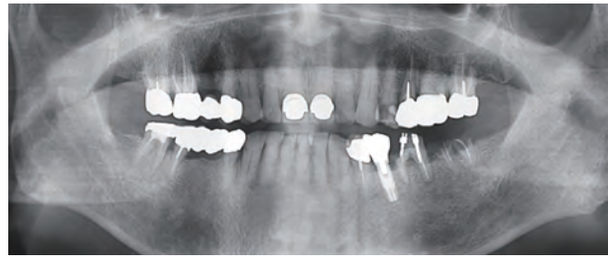


2019. 01. 29

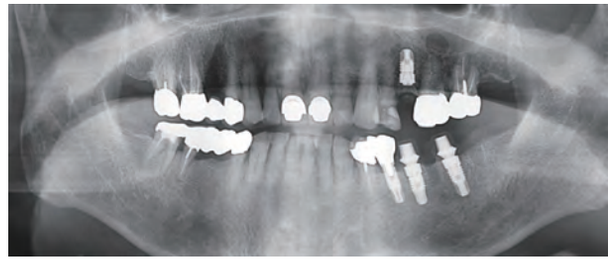
CLINICAL **CASE 41**

Autobone block with rhBMP-2 in lateral augmentation

95 years old, Male

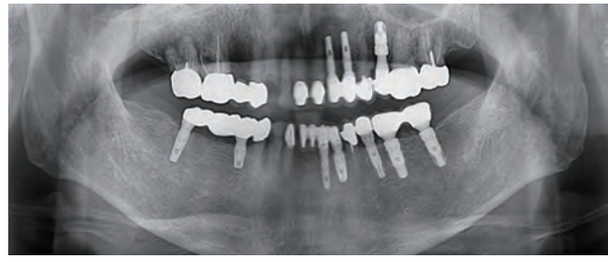


Preoperative
2010. 06. 24



Postoperative
2010. 07. 06

2 year 8 months
2013. 04. 10

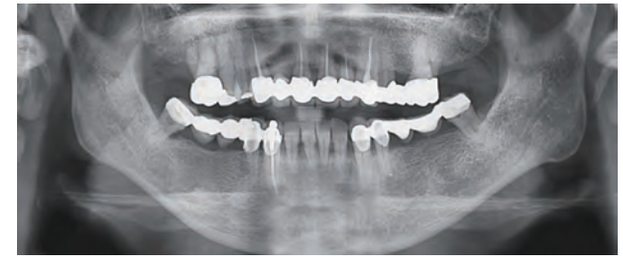


2019. 02. 28

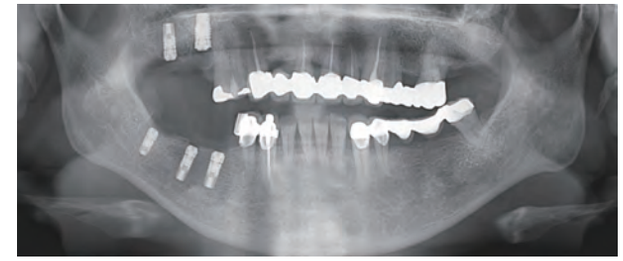
CLINICAL **CASE 42**

Tissue regeneration to the natural shape

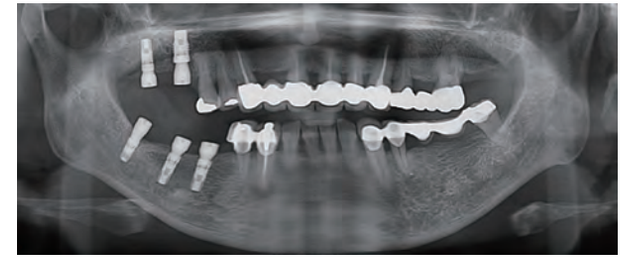
57 years old, Female



Preoperative
2010. 06. 25



Postoperative
2010. 07. 19



5 months
2010. 12. 09

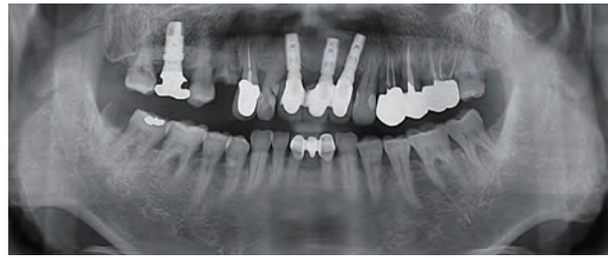
2019. 03. 28

CLINICAL **CASE 43**

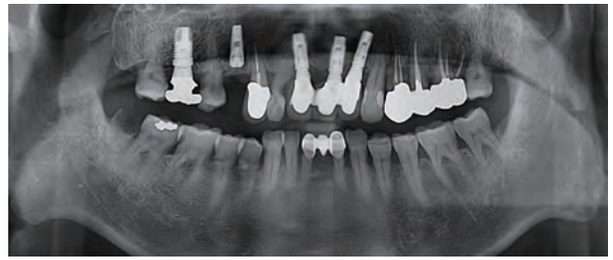
Open wound healing in premolar

71 years old, Male

Preoperative
2010. 06. 25

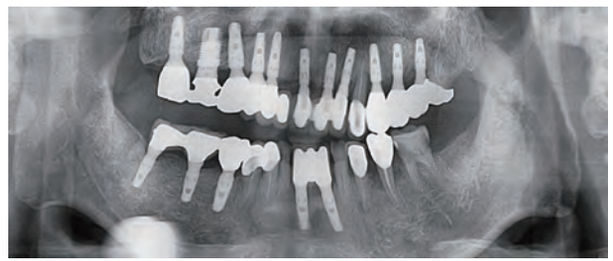


Postoperative
2010. 06. 25



7 months
2011. 03. 14

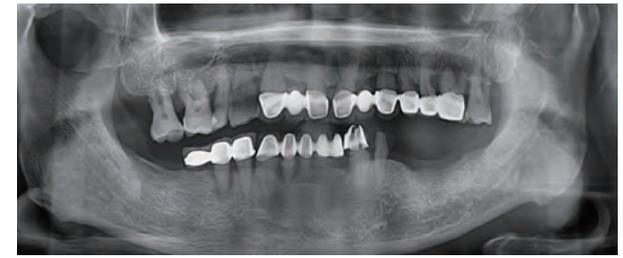
2019. 04. 03



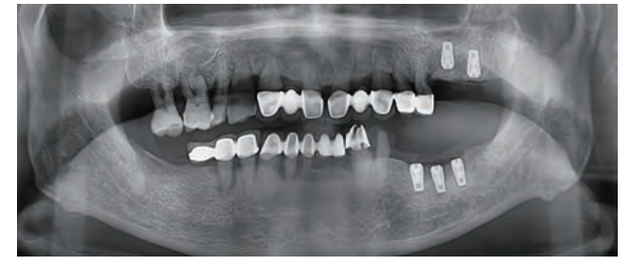
CLINICAL **CASE 44**

Open wound healing in molars

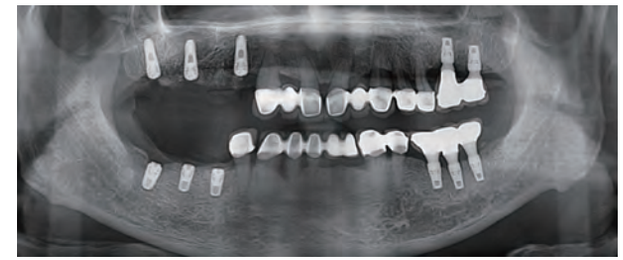
74 years old, Male



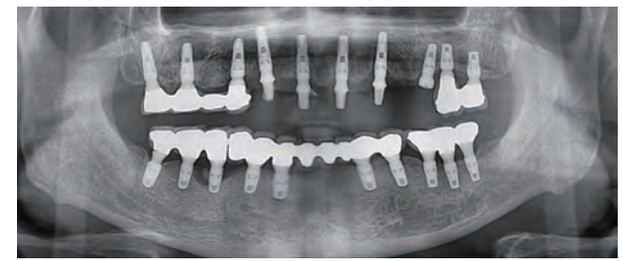
Preoperative
2010. 06. 28



Postoperative
2010. 06. 28



1 years
2011. 07. 05

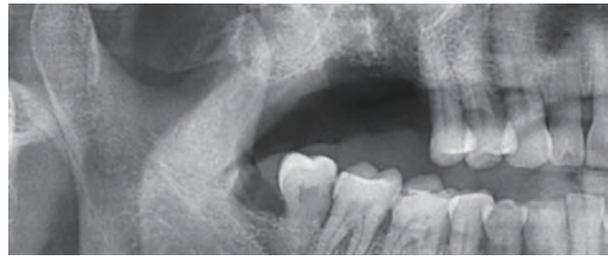


2019. 02. 14

CLINICAL **CASE 45**

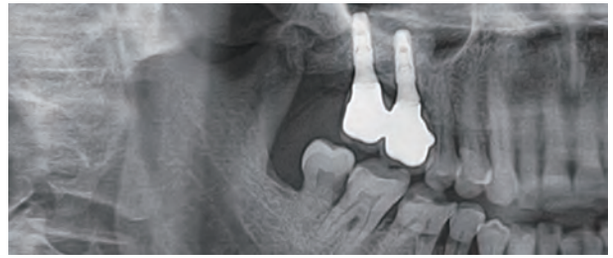
Bone graft with rhBMP-2

77 years old, Male

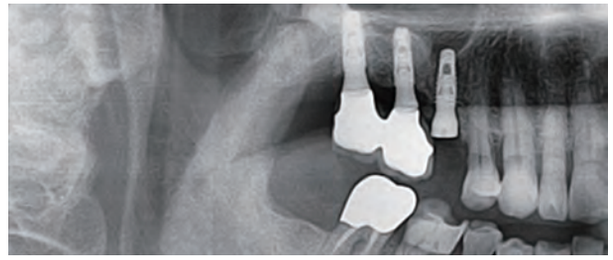


Preoperative
2010. 07. 16

Postoperative
2011. 11. 15



11 months
2012. 10. 04

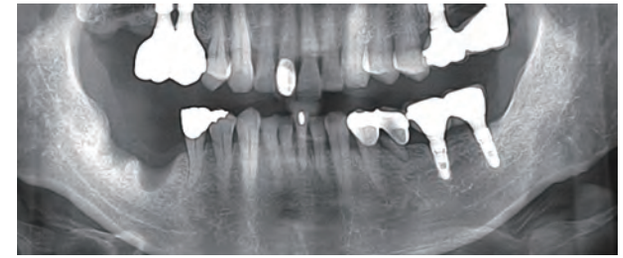


2019. 02. 27

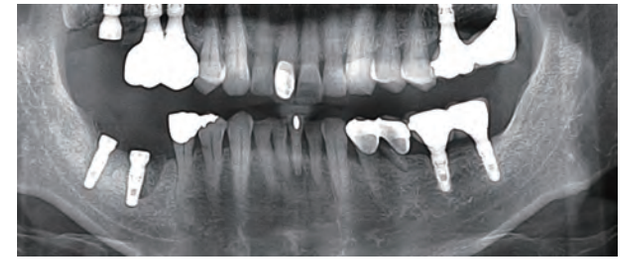
CLINICAL **CASE 46**

Vertical bone graft

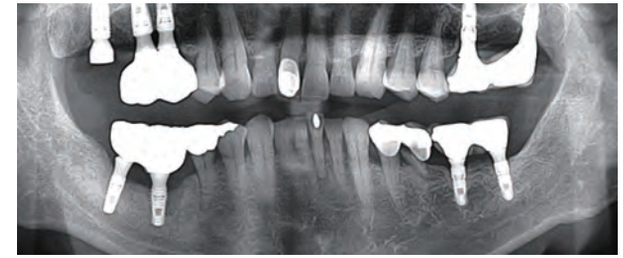
57 years old, Male



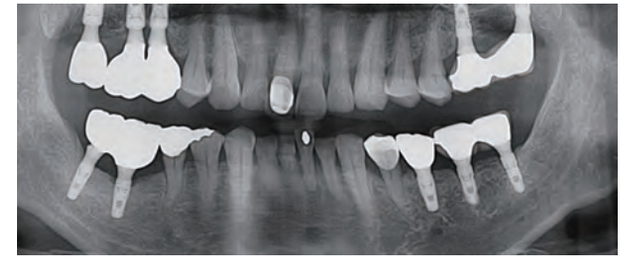
Preoperative
2010. 08. 02



Postoperative
2010. 08. 02



4 months
2010. 11. 30

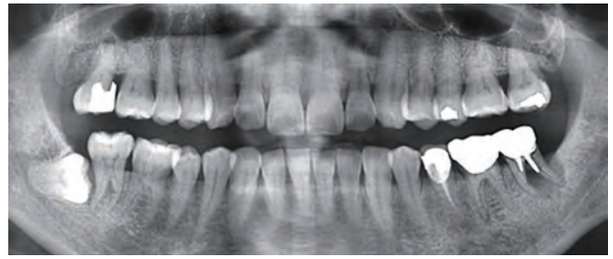


2019. 01. 09

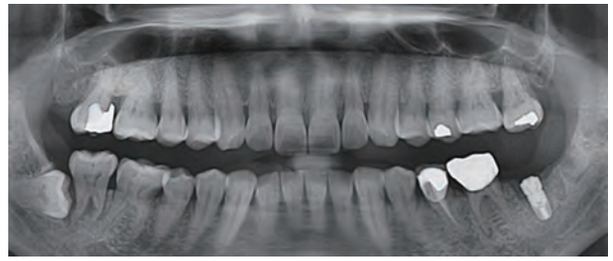
CLINICAL **CASE 47**

Autobone graft with rhBMP-2 in socket

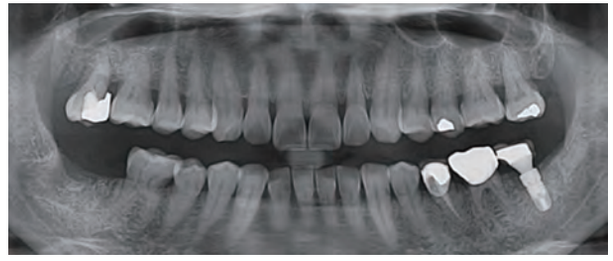
62 years old, Female



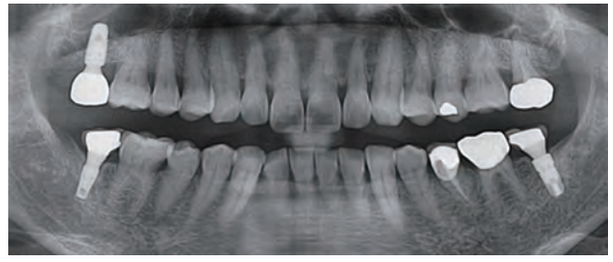
Preoperative
2010. 07. 05



Postoperative
2010. 12. 13



9 months
2011. 09. 08

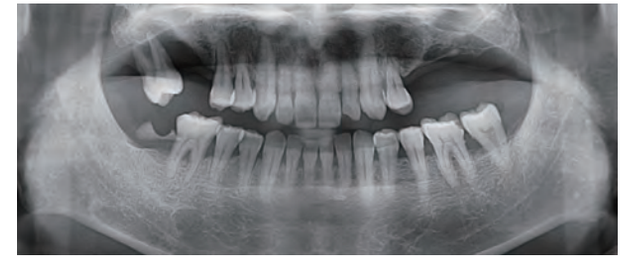


2019. 01. 02

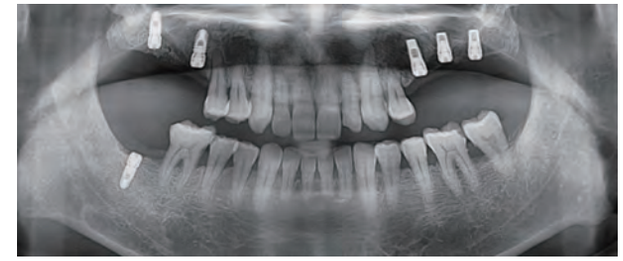
CLINICAL **CASE 48**

PRF bone graft

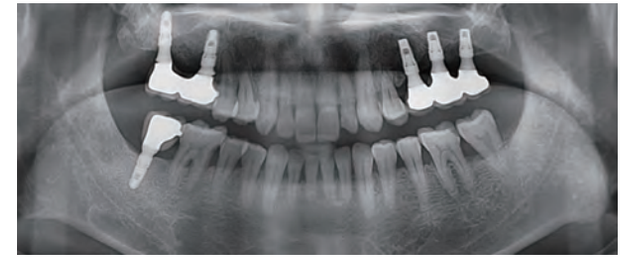
61 years old, Male



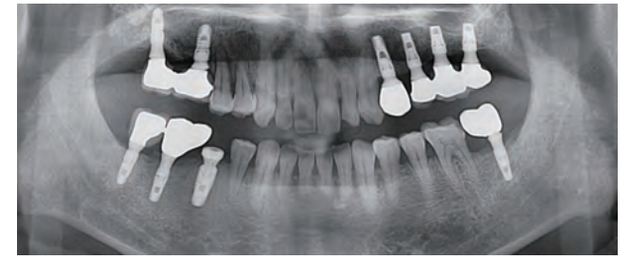
Preoperative
2010. 08. 10



Postoperative
2010. 11. 09



7 months
2011. 06. 22



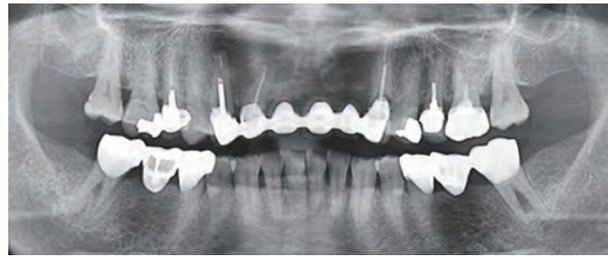
2019. 01. 04

CLINICAL **CASE 49**

Autobone graft in buccal bone

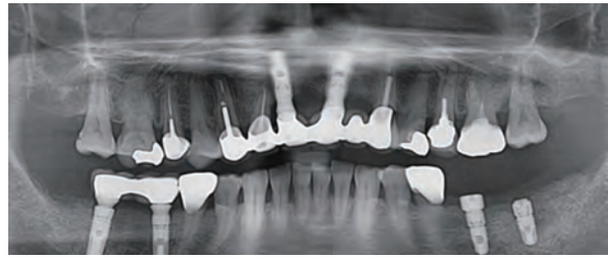
67 years old, Female

Preoperative
2010. 08. 23

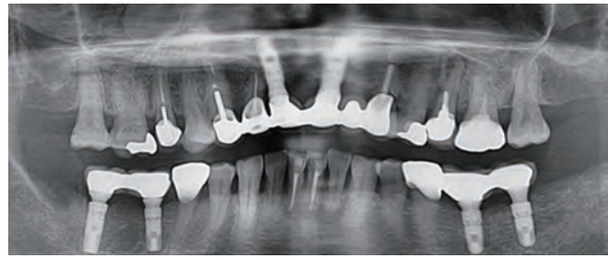


Postoperative
2010. 08. 27

7 months
2011. 03. 28



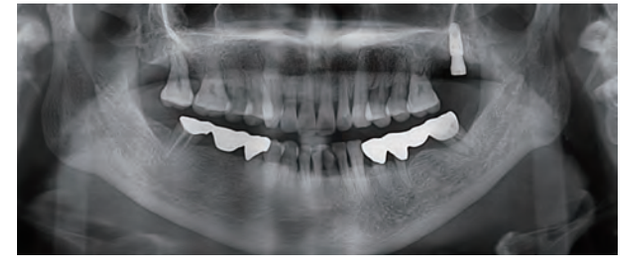
2019. 03. 26



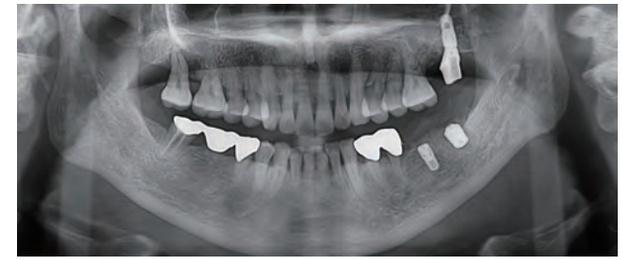
CLINICAL **CASE 50**

Bone graft with rhBMP-2

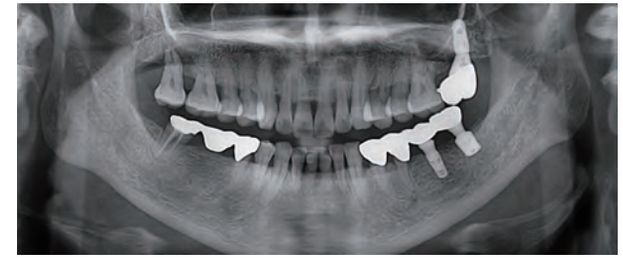
55 years old, Female



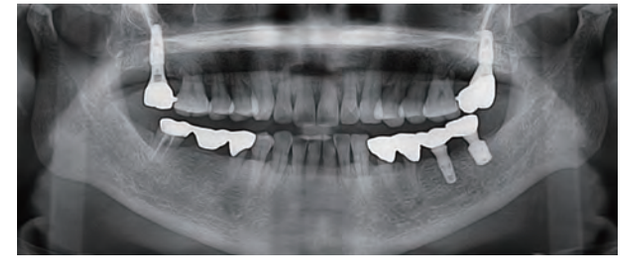
Postoperative
2010. 08. 24



9 months
2011. 05. 27



1 year 6 months
2012. 02. 29



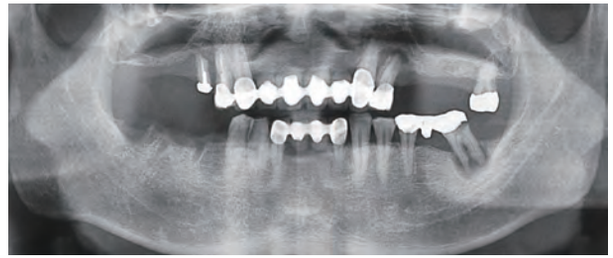
2019. 04. 12

CLINICAL **CASE 51**

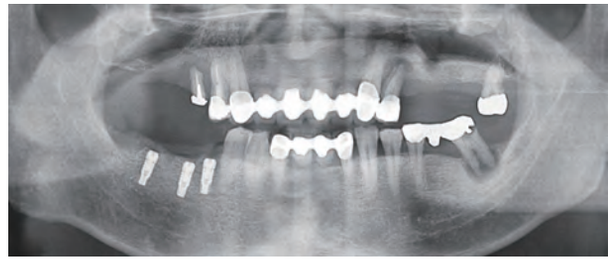
Autobone graft with rhBMP-2

64 years old, Male

Preoperative
2010. 09. 18



Postoperative
2010. 10. 02



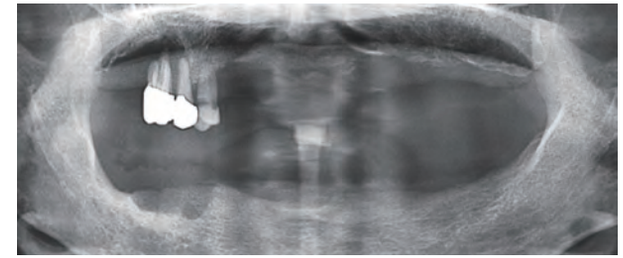
5 months
2011. 03. 02

2019. 02. 01

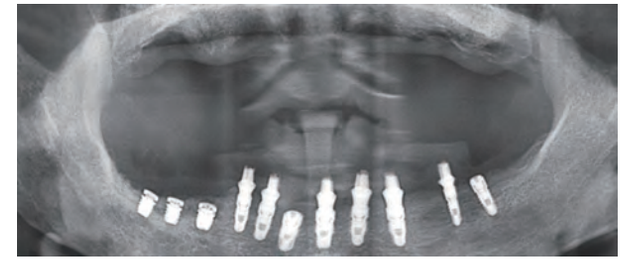
CLINICAL **CASE 52**

Full mouth rehabilitation

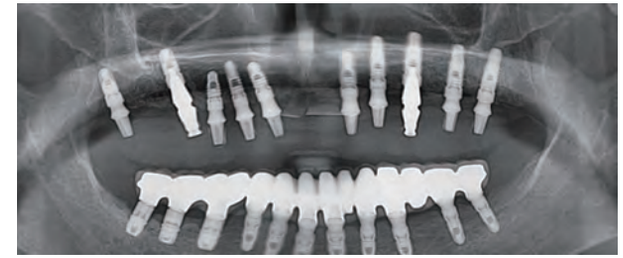
73 years old, Female



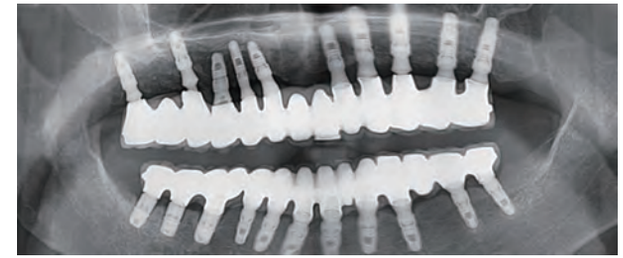
Preoperative
2010. 08. 06



Postoperative
2010. 10. 01



5 months
2011. 03. 29

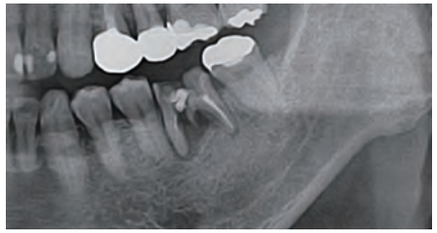


2019. 03. 21

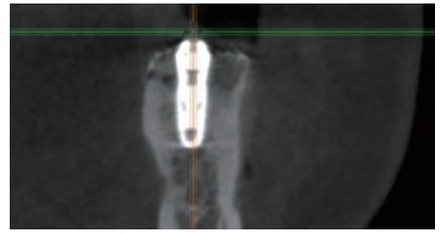
CLINICAL **CASE 53**

Bone regeneration with implant and abutment as scaffolds

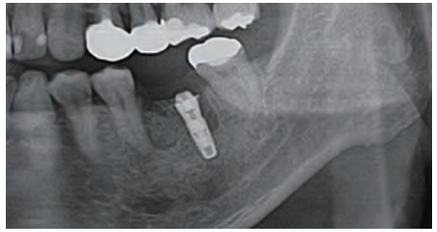
66 years old, Male



Preoperative *2010. 10. 08*



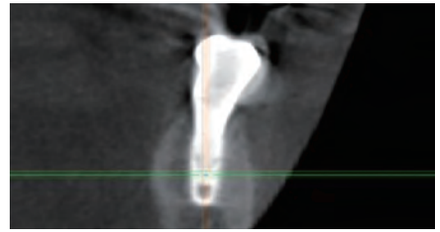
Postoperative *2011. 06. 27*



Postoperative *2011. 06. 27*

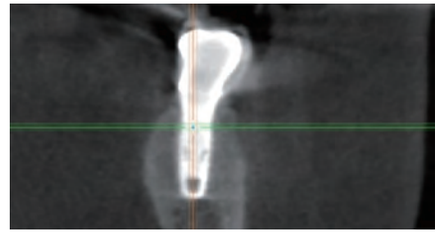
3 months *2011. 09. 03*

5 months *2011.11.30*



1 year 6 months *2013. 01. 25*

2019. 03. 29

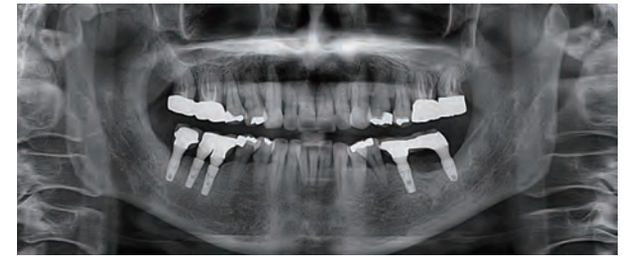


2019. 03. 29

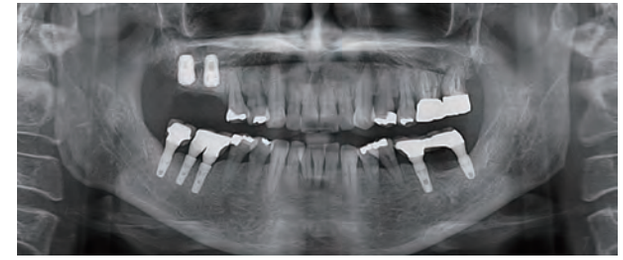
CLINICAL **CASE 54**

Open window healing

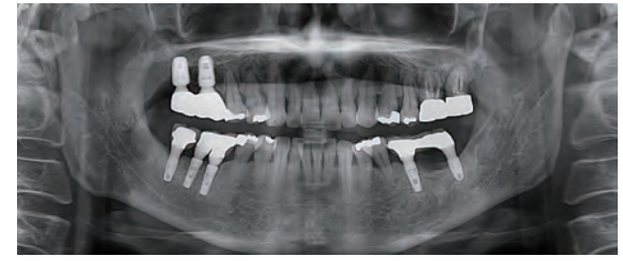
58 years old, Female



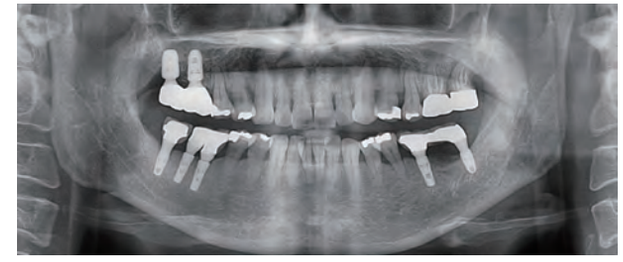
Preoperative
2010. 10. 20



Postoperative
2011. 03. 04



6 months
2011. 09. 02



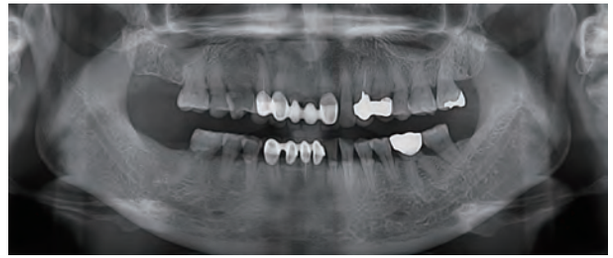
2019. 03. 25

CLINICAL **CASE 55**

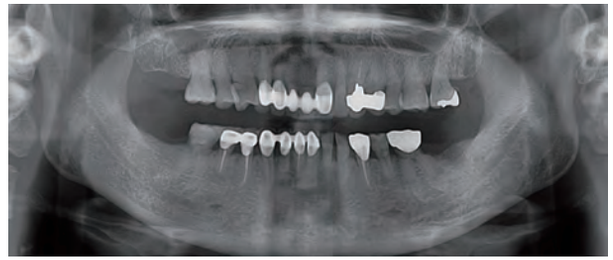
Contracted gingival restoration to the original shape

69 years old, Female

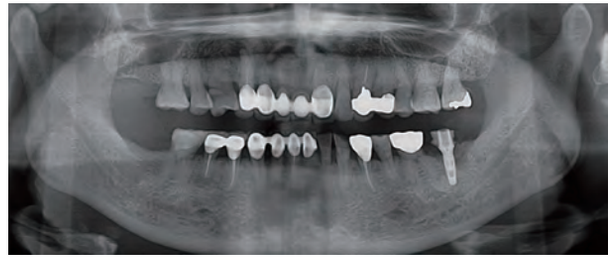
Preoperative
2010. 10. 25



2016. 03. 22



Postoperative
2016. 04. 04

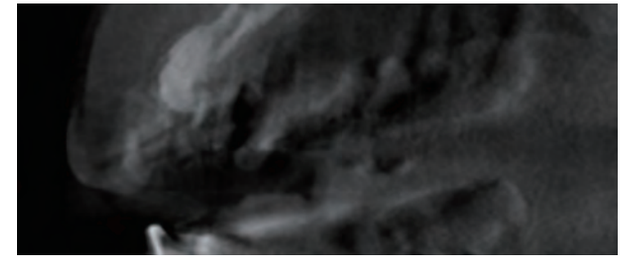


2019. 02. 12

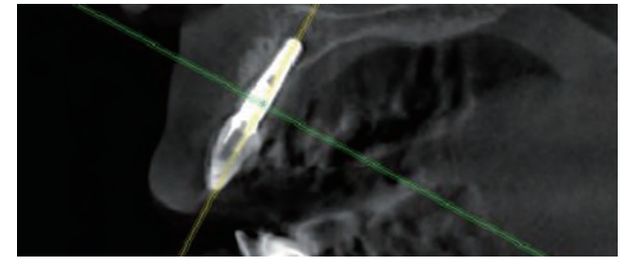
CLINICAL **CASE 56**

Tunnel bone graft

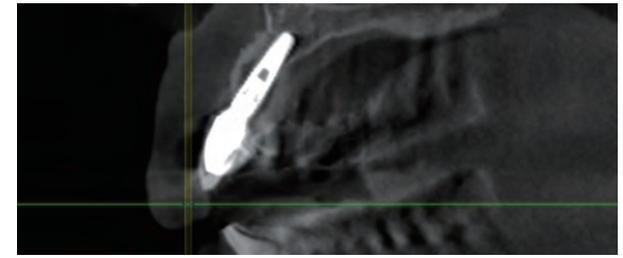
67 years old, Female



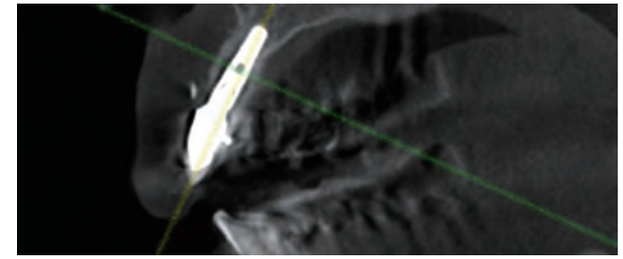
Preoperative
2010. 11. 01



Postoperative
2010. 11. 01



3 months
2011. 02. 21

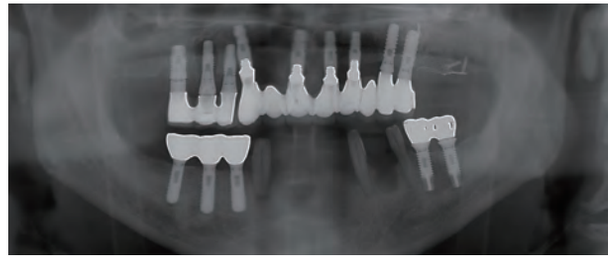


2019. 01. 03

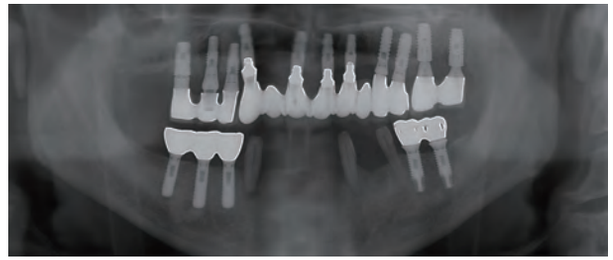
CLINICAL **CASE 57**

Sinus bone graft using tenting screw

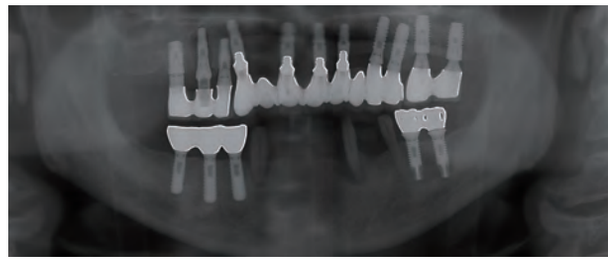
71 years old, Male



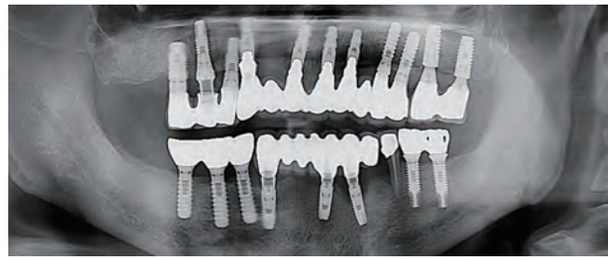
Preoperative
2010. 11. 08



Postoperative
2010. 12. 03



11 months
2011. 11. 12

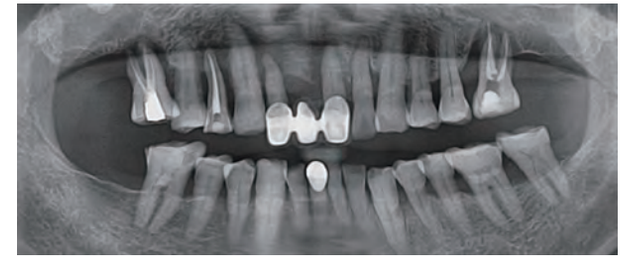


2019. 02. 12

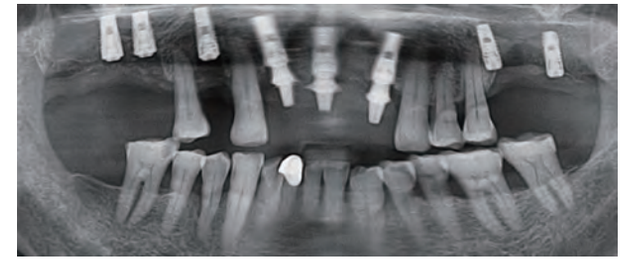
CLINICAL **CASE 58**

Buccal bone and adjacent teeth vertical bone graft

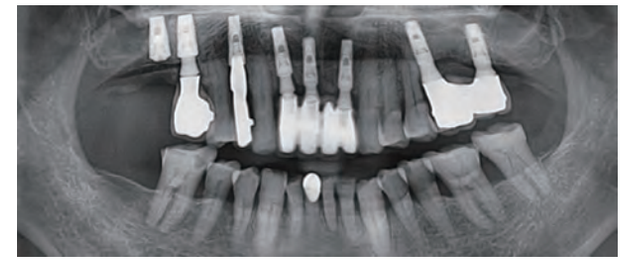
75 years old, Male



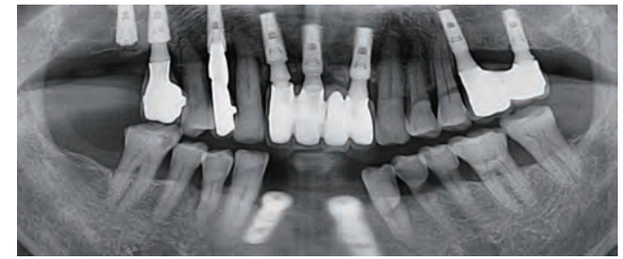
Preoperative
2010. 11. 15



Postoperative
2011. 03. 28



1 year 1 months
2012. 04. 17

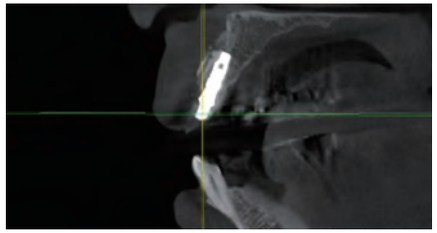


2019. 02. 15

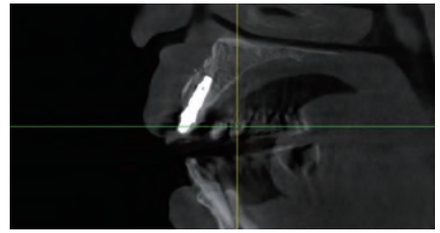
CLINICAL **CASE 59**

Bone regeneration with implant placement

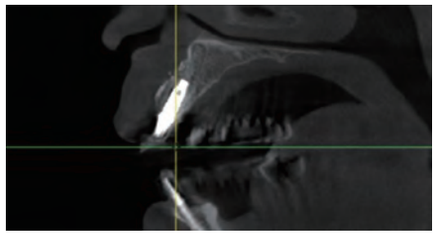
65 years old, Female



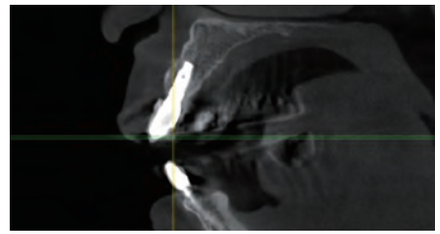
2010. 11. 30



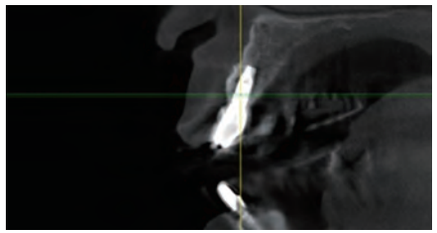
2011. 01. 05



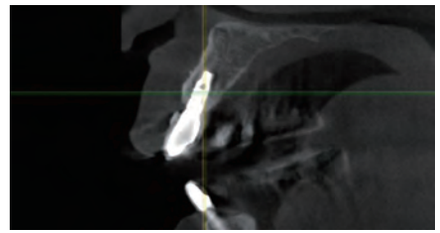
2011. 02. 07



2012. 01. 13



2013. 11. 08

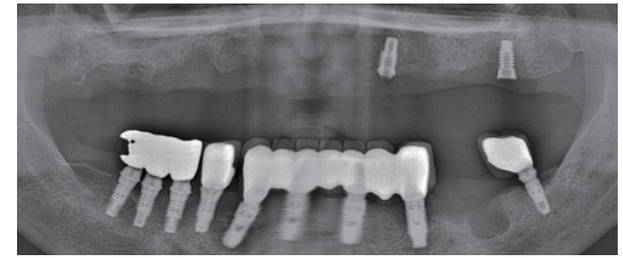


2019. 02. 19

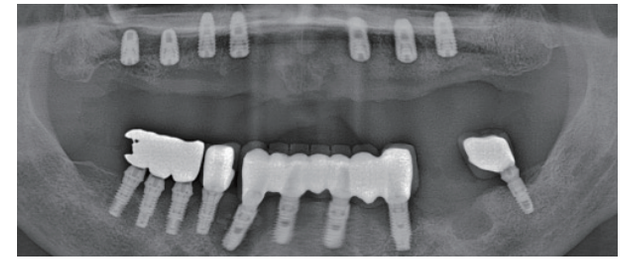
CLINICAL **CASE 60**

Maxillary Bone regeneration after fixture removal

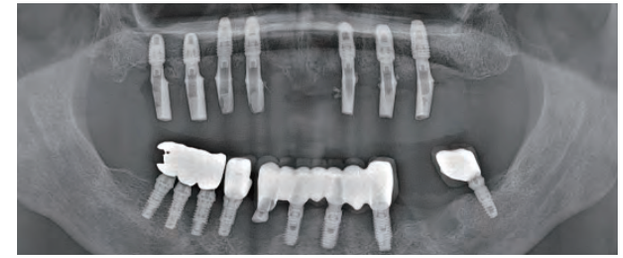
81 years old, Male



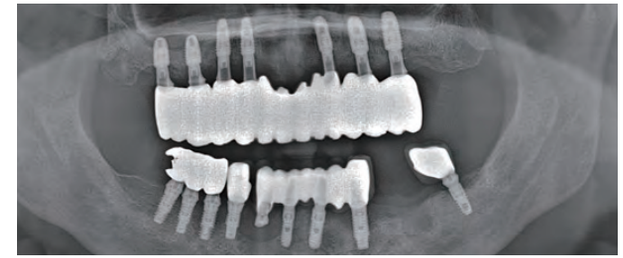
Preoperative
2024. 04. 05



Postoperative
2024. 04. 05



3 months
2024. 07. 04



2024. 08. 05

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